Measuring-Network of Wind Energy Institutes

20ec01

# Electrical Characteristics Proficiency Test

External Report

Issue Date 03.03.2025

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**Participants identities managed by Measnet Secretariat**

# Contents

# Preface

IEC Conformity Assessment Systems are globally recognized as giving consumers and industry more widely the confidence that a device or system meets or exceeds international standards.

IECRE is the global system for renewable energy conformity assessment and was established in 2014. Stakeholders in the system, those delivering conformity assessment activities, have to meet exacting criteria before being approved to operate.

In IECRE we have a global network of testing laboratories —known as RETLs— who meet the criteria in ISO/IEC 17025 for best management and measurement practice. An essential element of 17025 compliance is the demonstration of competence through inter laboratory or proficiency testing. Specifically for an international system with mutual acceptance of test results and certifications, proficiency testing is an integral element fostering the mutual trust which enable acceptance. All participants within the IECRE know and have proof that the system evaluates qualification to harmonized and aligned criteria.

IECRE has been working closely with MEASNET, who is the provider of proficiency testing in the renewables sector.

IECRE and MEASNET are delighted to publish the final report for the most recent round of Electrical Characteristics proficiency testing and to make this available to all stakeholders and interested parties.

This report is the most comprehensive overview of Electrical Characteristics evaluation ever undertaken by almost every testing organization active in the renewables sector and it is hoped demonstrates that all laboratories in IECRE have proved their competence through a thorough and independent process.

We encourage the reports use in the renewables sector and welcome any comments or feedback.

Wolfram Zeitz
IECRE Executive Secretary

Alistair Mackinnon
IECRE Chair

Alejandro Martínez
MEASNET Vice Chairman

# 1. Introduction & Methodology

Within the framework of the MEASNET network internal quality evaluation program, the collaboration with the IECRE organization and the consideration of proficiency testing as a service offered to its customers, an electrical characteristics proficiency test exercise was organized and performed.

This internal report is issued according to the contents described in the IECRE O.D. 551-17 [1]

## 1.1. Standards in Scope.

The participants performed the tasks according to the standard IEC 61400-21-1:2019 [2].

## 1.2. Methodology.

According to the IECRE O.D. 551-17 [1] the proficiency test was performed in two Rounds.

Round 1 is conceived as a preparation phase intended to find the sources of the differences among the participants, and is restricted to type A participants.

Round 2 is open to type A and type B participants. The Pass and Fail criteria proposed below shall be used by IECRE to determine the proficiency of the laboratories belonging to the system.

The used data sets for round 2 are identical in structure compared to data sets used in Round 1, but contain significantly different data. The PT is structured in separate tasks. For each task a separate data set was used.

## 1.3. Preliminary Line Choice.

The line choice is a set of instructions handled to the participants explaining which options, among those valid and present in the standard, have to be taken in order to improve the intercomparability of the results. The following documents were provided to the participants to be taken into account for the evaluation of the tasks:

- Measnet “Procedure for Measurement of Electrical Characteristics”, V1 2019-06
- Clarification Sheet “20ec01 CS#1”
- Electrical Characteristics Proficiency Test – Round 2 Instructions - Rev.2, 2023-01-04

# 2. Topics covered by the PT

## 2.1. Task 1 – Flicker during continuous operation (synthetic data, flicker coefficient)

### Task definition

Evaluation of the flicker coefficient $c(\psi_k)$ for network impedance phase angles $\psi_k$ = 30°, 50°, 70°, and 85° based on synthetic data according to IEC 61400-21-1 Annex B.3.4.

### Database

1 x 10-minute file in matlab and famos format + 1 extension datafile (in case needed for filter activation) for each network impedance phase angle.

### Additional information for the evaluation

No 95$^{th}$ percentile has to be determined.

Only results from the main data set shall be presented (not from the extension data sets).

### Pass and fail criteria

Hard limit according to IEC 61400-21-1 Annex B.3.4: the target values is 2. The values need to be in the tolerance of target value ±5% of target value.

## 2.2. Task 2 (optional) – Flicker during continuous operation (synthetic data, $P_{inst.max}$)

### Task definition

Evaluation of the $P_{inst, max}$ values which are generated between block 4 and block 5 from Flickermeter according to IEC 61000-4-15:2010 for each phase. This task is OPTIONAL, because this values might not always be available in the used software.

### Database

1 x 10-minute file in matlab and famos format + 1 extension datafile (in case needed for filter activation).

### Additional information for the evaluation

In this calculation the measured voltage should be used instead of the simulated voltage from the fictitious grid.

The voltage level of the lamp according to IEC 61000-4-15:2010 is 230 V

Only results from the main data set shall be presented.

### Pass and fail criteria

Hard limit according to IEC 61000-4-15:2010 Chapter 6.2: the target values is 1. The values need to be in the tolerance of target value ±8% of target value.

## 2.3. Task 3 – Flicker during continuous operation (real data, flicker coefficient)

### Task definition

Evaluation of the flicker coefficient $c(\psi_k)$ for network impedance phase angles $\psi_k$ = 30°, 50°, 70°, and 85° according to IEC 61400-21-1 chapter 8.2.2.

### Database

1 x 10-minute file in matlab and famos format + 1 extension datafile (in case needed for filter activation).

### Additional information for the evaluation

Maximum value from all 3 phases should be reported.

No 95$^{th}$ percentile has to be determined.

Only results from the main data set shall be presented.

### Pass and Fail Criteria

Zeta' Score according to Chapter 3. The median of all results is used as assigned value ($V_{ref}$). An additional error limit of ±5 % of the assigned value is used (for the calculation of $\sigma_p$).

## 2.4. Task 4 – Flicker and voltage change during switching operations (real data, flicker step factor and voltage change factor)

### Task definition

Evaluation of the flicker step factor $k_f(\psi_k)$ for network impedance phase angles $\psi_k$ = 30°, 50°, 70°, and 85 according to IEC 61400-21-1 chapter 8.2.3.

Evaluation of the voltage change factor $k_u(\psi_k)$ for network impedance phase angles $\psi_k$ = 30°, 50°, 70°, and 85° according to IEC 61400-21-1 chapter 8.2.3.

### Database

1 x 10-minute file in matlab and famos format + 1 extension datafile (in case needed for filter activation).

### Additional information for the evaluation

-

### Pass and Fail Criteria

Zeta' Score according to Chapter 3. The median of all results was used as assigned value ($V_{ref}$). An additional error limit of ±5 % of the assigned value is used (for the calculation of $\sigma_p$).

## 2.5. Task 5 – Harmonics, interharmonics, higher frequency components (synthetic data)

### Task definition

Task 5.1 - evaluation of current harmonics according to IEC 61400-21-1 Chapter 8.2.4.

Task 5.2 - evaluation of interharmonics according to IEC 61400-21-1 Chapter 8.2.4.

Task 5.3 - evaluation of higher frequency components according to IEC 61400-21-1 Chapter 8.2.4.

### Database

1 x 10-minute file in matlab and famos format. The settings of synthetic frequencies are given in Chapter 6.5.

### Additional information for the evaluation

Maximum value from all 3 phases should be reported.

No $95^{th}$ percentile must be determined.

Result values < 0.1 % $I_n$ have to be reported.

### Pass and fail criteria

Zeta' Score according to Chapter 3. The assigned value ($V_{ref}$) is given according to the settings in chapter 6.5. Only results with an assigned value ≥ 0.1 % $I_n$ are considered for the determination of the level of compliance. Results with an assigned value < 0.1 % $I_n$ are given informative.

## 2.6. Task 6 – Harmonics, interharmonics, higher frequency components (real data)

### Task definition

Task 6.1 - evaluation of current harmonics according to IEC 61400-21-1 Chapter 8.2.4.

Task 6.2 - evaluation of interharmonics according to IEC 61400-21-1 Chapter 8.2.4.

Task 6.3 - evaluation of higher frequency components according to IEC 61400-21-1 Chapter 8.2.4.

### Database

1 x 10-minute file in matlab and famos format.

### Additional information for the evaluation

Maximum value from all 3 phases should be reported.

No $95^{th}$ percentile must be determined.

Result values < 0.1 % $I_n$ have to be reported.

### Pass and fail criteria

Zeta' Score according to Chapter 3. The median of all results was used as assigned value ($V_{ref}$). Only results with an assigned value ≥ 0.1 % $I_n$ are considered for the determination of the level of compliance. Results with an assigned value < 0.1 % $I_n$ are given informative.

## 2.7. Task 7 – Maximum power

### Task definition

Determine the maximum values of active power out of 3 datasets for the below given intervals according to IEC 61400-21-1 Chapter 8.3.3:

- $P_{0.2}$ (200ms)
- $P_{60}$ (60s)
- $P_{600}$ (600s)

Results need to be given in kW and as normalized values.

### Database

3 x 10-minute files in matlab and famos format.

### Additional information for the evaluation

Line Choice:
For the calculation of the different averaging intervals the block average method shall be applied (0.2 s / 60 s / 600 s).

### Pass and Fail Criteria

Zeta' Score according to Chapter 3. The median of all results was used as assigned value ($V_{ref}$).
An additional error limit of ±0.5 % of the assigned value is used (for the calculation of $\sigma_p$).

## 2.8. Task 8 – Reactive power characteristics (Q=0)

### Task definition

Calculate P, Q, cos (φ) and $U_1$ according to IEC 61400-21-1 Chapter 8.3.4 and Annex C.

### Database

1 x 10-minute file in matlab and famos format.

### Additional information for the evaluation

The voltage needs to be reported as phase-to-neutral voltage like described in IEC 61400-21-1 Annex C.2

### Pass and Fail Criteria

Zeta' Score according to Chapter 3. The median of all results was used as assigned value ($V_{ref}$). An additional error limit of ±0.5 % of the assigned value is used (for the calculation of $\sigma_p$).

## 2.9. Task 9 – Undervoltage events

### Task definition

Evaluation of all values according to result template (acc. IEC 61400-21-1 Chapter 8.5 and Annex A.5, table A.40).

### Database

1 file in matlab and famos format.

### Additional information for the evaluation

For the calculation of the relevant parameter and time intervals the following documents must be considered:

- Measnet “Procedure for Measurement of Electrical Characteristics”, V1 2019-06 (Annex A.3).
- Clarification Sheet “20ec01 CS#1”.

Additional clarification:

The observation period for the calculation of the response and settling times after the fault shall be $t_{clear}$ until $t_{clear}$ + 10 s.
In case the measured values are already inside the tolerance at the relevant starting time, the times shall be given as 0.000 s.

The time of entrance of the voltage dip and the time of clearance is given by the coordinator and shall be used for the evaluation in order to improve the intercomparability of results.

The tolerance band is 0.1 p.u. (related to nominal value). The reference value is the steady state value in the evaluation period.

### Pass and Fail Criteria

Zeta’ Score according to Chapter 3. The median of all results was used as assigned value ($V_{ref}$).

## 2.10. Task 10 – Overvoltage events

### Task definition

Evaluation of all values according to result template (acc. IEC 61400-21-1 Chapter 8.5 and Annex A.5, table A.40).

### Database

1 file in matlab and famos format.

### Additional information for the evaluation

For the calculation of the relevant parameter and time intervals the following documents must be considered:

- Measnet “Procedure for Measurement of Electrical Characteristics”, V1 2019-06 (Annex A.3).
- Clarification Sheet “20ec01 CS#1”.

Additional clarification:

The observation period for the calculation of the response and settling times after the fault shall be $t_{clear}$ until $t_{clear}$ + 10 s.
In case the measured values are already inside the tolerance at the relevant starting time, the times shall be given as 0.000 s.

The time of entrance of the voltage dip and the time of clearance is given by the coordinator and shall be used for the evaluation in order to improve the intercomparability of results.

The tolerance band is 0.1 p.u. (related to nominal value). The reference value is the steady state value in the evaluation period.

### Pass and Fail Criteria

Zeta’ Score according to Chapter 3. The median of all results was used as assigned value ($V_{ref}$).

# 3. Pass / Fail Criteria

The RETLs belonging to IECRE must fulfil the following Pass and Fail Criteria in order to be part of the IECRE system. These are not mandatory for other participants.

Three levels of compliance have been defined for the IECRE Test Laboratories:

- Green level: The results are considered correct. An analysis is considered in the green level if all the values are in the green level.
- Yellow level: The results are considered as a possible deviation. An analysis is considered in the yellow level if there is one or more values in the yellow level but not in the red level.
- Red level: The results are considered as a deviation. An analysis is considered in the red level if there is one or more values in the red level.

In the tasks where the Z-Score metric is to be used, a value equal or below 2 is in the green level, a value between 2 and 3 is in the yellow level and a value equal or higher than 3 is in the red level. In the tasks where a hard limit is used, no yellow level is defined, a deviation above the limit is considered as a red level deviation:

| Level of compliance | GREEN | YELLOW | RED |
|---|---|---|---|
| Z-Score (Zeta' Score) | ≤ 2 | >2 and <3 | ≥ 3 |
| Hard limit | Within tolerance | - | Out of tolerance |

### Calculation of performance statistics

The calculation of the Z-Score for Round 2 was slightly changed compared to Round 1. This was already part of new evaluation after Round 1 (results shared on 21.10.2021 in Round 1 group). The standard uncertainty was extended by the following parameter:

- standard deviation of non-outlying results
- standard uncertainty of the reported rounded digit
- standard uncertainty of numerical calculation results based on different procedures

In the following the Z-Score is named Zeta' Score.

A procedure using the above mentioned Zeta' Score is also described in the document "Technical Note – Round Robin Score assessment – Draft edition, July 2021" [5] by CRES (Centre For Renewable Energy Sources and Saving).

The Zeta' Score is calculated using the following equation:

$$\frac{|R_i - V_{ref}|}{\sqrt{{\sigma_R}^2 + {\sigma_d}^2 + {\sigma_p}^2}}$$

with

- $R_i$: reported result
- $V_{ref}$: assigned value (median in case of non-synthetic data)
- $\sigma_R$: standard deviation of non-outlying results
- $\sigma_d$: standard uncertainty of the reported rounded digit
- $\sigma_p$: standard uncertainty of numerical calculation results based on different procedures

The used values of the above mentioned parameter for each task are given in the result tables in chapter 6.

The assigned values ($V_{ref}$) according to [4] is a value attributed to a particular property of a proficiency test item. One possible implementation is to define it as consensus values from participant's results. An outlier-resistant median calculation was used in case of non-synthetic data.

In case of extreme outliers, [4] gives the possibility to identify and exclude these outliers from the calculation. An identification of extreme outliers was only done when the Zeta'-Score calculation was not producing any reasonable results. Only if a value is identified as extreme outlier, it will not be considered for the standard deviation ($\sigma_R$).

The standard uncertainty of the reported rounded digit ($\sigma_d$) is defined by the following equation:

$$\frac{\text{digit}}{\sqrt{2}}$$

Example for 2 decimal places: digit = 0.01

In case an additional error limit (e) is used for the standard uncertainty of numerical calculation results based on different procedures ($\sigma_p$) it is given for each task in chapter 2 and chapter 6. The error limits were chosen as conclusion after Round 1 of the PT. An additional error limit was only used for tasks 3 and 4 (e = 5%) and for tasks 7 and 8 (e = 0.5%). The following equation is applied for $\sigma_p$:

$$\frac{\text{e} * \text{Vref}}{2}$$

Text or additional information from participants will be interpreted in favour of the participants if possible.

## Global PT Pass and Fail Criteria

If a participant result is in the red zone in any of the tasks, the results are considered as fail in the Proficiency Test.

If a participant falls in the yellow zone in three or more tasks, the results are considered as fail in the Proficiency Test.

| Level of compliance | Pass | Pass (correction plan advised) | **FAIL (correction plan according to [1])** |
|---|---|---|---|
| Number of tasks in the specific level | No task in yellow or red level | Maximum 2 tasks in yellow level, no task in red level | One or more tasks in red level or more than 2 tasks in yellow level |

# 4. Participant List

The participants enlisted for Round 1 & Round 2 (Type A participants) are, in alphabetical order:

| TESTING LABORATORY |
|---|
| Anonymous laboratory 1[1] |
| Barlovento Applus+ |
| Centre for Renewable Energy Sources and Saving - CRES |
| China Classification Society Certification Co., Ltd. - CCSC |
| China Electric Power Research Institute - CEPRI |
| DNV Energy Systems Germany GmbH |
| DNV Maritime and Energy, S.L.U. |
| Shanghai SERCAL New Energy Technology Co., Ltd. |
| UL International GmbH |
| WIND-consult GmbH |
| WindGuard Certification GmbH |
| windtest grevenbroich gmbh |

Participant registered for Round 2 only (Type B participant):

| TESTING LABORATORY |
|---|
| FGH Zertifizierungsgesellschaft GmbH |

[1] Anonymous laboratory 1 has not granted MEASNET permission to display its name on this list.

# 5. Proficiency Test Calendar

The following calendar describes the process of the Proficiency Test:

Preparation:

| | |
|---|---|
| Application period deadline for Round 1 | 29.01.2021 |
| Election of coordinator & participation appeals | 01.02.2021 to 05.02.2021 |
| Fees payment deadline for Round 1 participants | 12.04.2021 |

Round 1:

| | |
|---|---|
| Round 1 Instructions delivery | 15.02.2021 |
| Round 1 results submission deadline | 15.04.2021 |
| Round 1 data analysis from conductor | 19.04.2021 to 23.04.2021 |
| Round 1 results discussion | 26.04.2021 \| 08.11.2022[2] |

Round 2:

| | |
|---|---|
| Application period deadline for Round 2 | 01.11.2022 |
| Fees payment deadline for Round 2 participants | 30.11.2022 |
| Round 2 Kick-off Meeting | 20.12.2022 |
| Instructions delivery | 21.12.2022 |
| Q&A period | 21.12.2022 to 30.01.2023 |
| Round 2 results submission deadline | 13.02.2023 |
| Data analysis from conductor | 14.02 to 03.03.2023 |
| Results communication & room for non-technical corrections | 06 to 20.03 |
| Participant report creation | 21.03 to 25.04.2023 |
| Final results publication | February 2025[3] |

[2] The lengthy period of discussion was due to the issuance of a clarification sheet, sent to the IECRE on December 8th, 2021. In addition, some changes in the coordination of the PT due to unforeseen circumstances influenced the delay of the original timeline.
[3] Originally scheduled for April-May 2023, the issue of the IECRE Final Report was delayed to allow participants who did not pass the Proficiency Test sufficient time to work with the IECRE Lead Assessor on their correction plan, as stated in IECRE OD 551-17.

# 6. Results provided by the participants

## General information:

The following chapters show the results delivered by the participants, as well as the evaluation of the level of compliance for each task.

## Presentation of results:

**Tasks with hard limit (Task 1 - Task 2):**

The result table shows the results delivered by the participants and the level of compliance for the specific task (green and red according to Chapter 3.) The statistics are given for all participants and additionally for the successful ones. The additional statistics for the successful participants are only given in case that at least one participant is in the red level of compliance for the specific task.

Values that are identified in the red level are **remarked with the corresponding background color**, and also the participant number and ID is remarked accordingly. In case that a value is identified as an extreme outlier, it is remarked in **purple background color**.

**Tasks with Zeta' Score metric (Task 3 - Task 10):**

The first tables show the results delivered by the participants, including the statistics and the used parameter for the Zeta' Score calculation. The statistics are given for all participants and additionally for the successful ones. The additional statistics for the successful participants are only given in case that at least one participant is in the red level of compliance for the specific task.

The Zeta' Score evaluation is shown then in the following tables. At the end of the Zeta' Score tables, the overall evaluation of the level of compliance for the specific task is shown (green, yellow and red, according to Chapter 3).

Single Values that are identified in the red and yellow level are remarked in the result tables, as well in the Zeta' Score tables, **with the corresponding color**. Also, the participant number and ID is remarked accordingly. In case a value is identified as an extreme outlier, it is remarked in **purple background color** in the result tables.

In Task 5 and Task 6 (harmonics), only results ≥ 0.1% $I_n$ are considered for the evaluation of the level of compliance (see explanation in chapters 6.5 and 6.6). Values below this threshold are shown in **grey background** and are given for informative purposes only.

For some tasks (Task 5, Task 6, Task 9 and Task 10), the result and Zeta' Score tables had to be split into several tables due to size and number of result values. In this case the overall evaluation of the level of compliance for the specific task is shown at the end of the last Zeta' Score table.

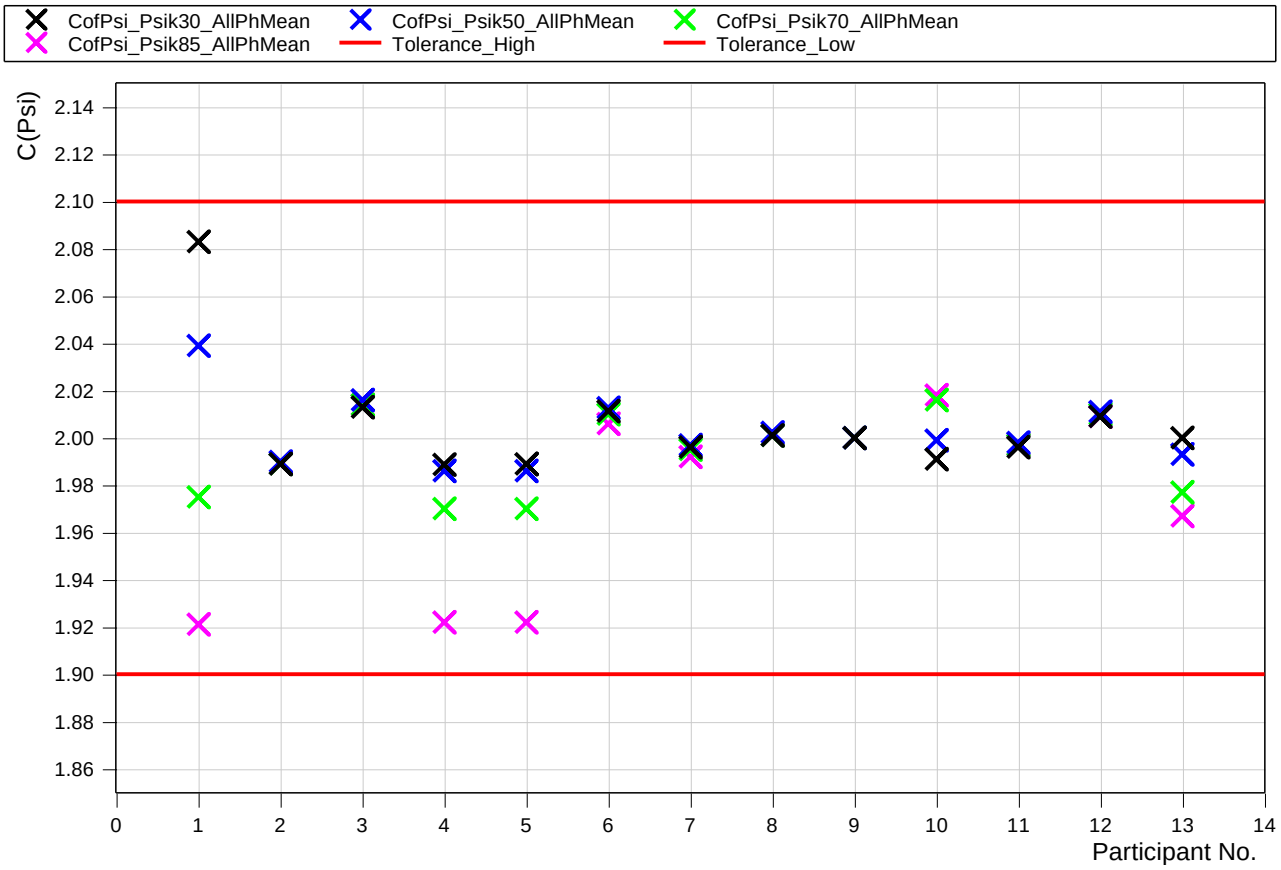
## 6.1. Task 1 – Flicker during continuous operation (synthetic data, flicker coefficient)

Pass/Fail Criteria according to [2], Chapter B.3.4: the observed flicker coefficient should be 2 with a tolerance of ±5% of 2. In this task no participant is located in the red level.

The following table shows the results delivered by the participants and the corresponding statistics.

| Participant | | Flicker Coefficient c($\psi_k$) - 3 phase mean value | | | | Level of compliance (overall task 1) |
|---|---|---|---|---|---|---|
| No. | ID | $\psi_k$ = 30° | $\psi_k$ = 50° | $\psi_k$ = 70° | $\psi_k$ = 85° | |
| 1 | 0581 | 2.083 | 2.039 | 1.975 | 1.921 | |
| 2 | 0857 | 1.989 | 1.990 | 1.989 | 1.989 | |
| 3 | 1136 | 2.013 | 2.016 | 2.014 | 2.014 | |
| 4 | 2033 | 1.989 | 1.986 | 1.970 | 1.922 | |
| 5 | 2546 | 1.989 | 1.986 | 1.970 | 1.922 | |
| 6 | 3866 | 2.011 | 2.013 | 2.010 | 2.006 | |
| 7 | 4515 | 1.996 | 1.997 | 1.995 | 1.992 | |
| 8 | 4803 | 2.001 | 2.002 | 2.001 | 2.001 | |
| 9 | 6432 | 2.000 | 2.000 | 2.000 | 2.000 | |
| 10 | 6805 | 1.991 | 1.999 | 2.016 | 2.018 | |
| 11 | 8373 | 1.996 | 1.998 | 1.997 | 1.997 | |
| 12 | 8418 | 2.009 | 2.011 | 2.010 | 2.009 | |
| 13 | 8819 | 2.000 | 1.993 | 1.977 | 1.967 | |
| Statistics (all Participants) | Median | 2.000 | 1.999 | 1.997 | 1.997 | - |
| | Min | 1.989 | 1.986 | 1.970 | 1.921 | - |
| | Max | 2.083 | 2.039 | 2.016 | 2.018 | - |
| | Standard Deviation | 0.024 | 0.014 | 0.016 | 0.035 | - |

The following figure shows the results for all participants.



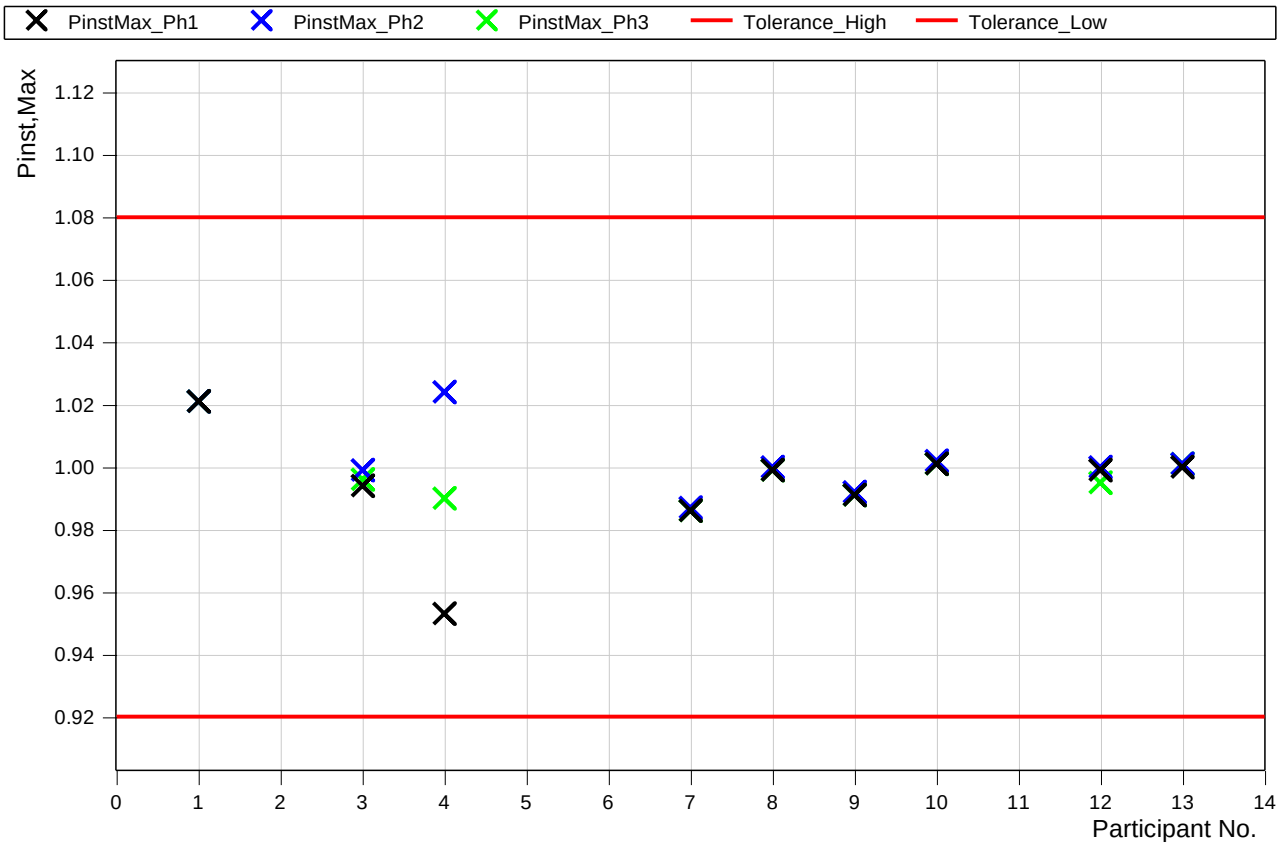
## 6.2. Task 2 (optional) – Flicker during continuous operation (synthetic data, $P_{inst.max}$)

Pass/Fail Criteria according to [6], Chapter 6.2: the Pinst.max values must be 1 with the tolerance of ±8% of 1. This task is optional, as not all participants might have access to this interim result in the software. The Pass/Fail Criteria were not applied for participants who did not deliver data for this task. In this task no participant is located in the red level.

The following table shows the results delivered by the participants and the corresponding statistics.

| Participant | | $P_{inst.max}$ | | | Level of compliance (overall task 2) |
|---|---|---|---|---|---|
| No. | ID | Phase 1 | Phase 2 | Phase 3 | |
| 1 | 0581 | 1.021 | 1.021 | 1.021 | |
| 2 | 0857 | -- | -- | -- | -- |
| 3 | 1136 | 0.994 | 0.999 | 0.996 | |
| 4 | 2033 | 0.953 | 1.024 | 0.990 | |
| 5 | 2546 | -- | -- | -- | -- |
| 6 | 3866 | -- | -- | -- | -- |
| 7 | 4515 | 0.986 | 0.987 | 0.986 | |
| 8 | 4803 | 0.999 | 1.000 | 0.999 | |
| 9 | 6432 | 0.991 | 0.992 | 0.991 | |
| 10 | 6805 | 1.001 | 1.002 | 1.001 | |
| 11 | 8373 | -- | -- | -- | -- |
| 12 | 8418 | 0.999 | 1.000 | 0.995 | |
| 13 | 8819 | 1.000 | 1.001 | 1.001 | |
| Statistics (all participants who delivered results) | Median | 0.999 | 1.000 | 0.996 | -- |
| | Min | 0.953 | 0.987 | 0.986 | -- |
| | Max | 1.021 | 1.024 | 1.021 | -- |
| | Standard Deviation | 0.017 | 0.011 | 0.010 | -- |

The following figure shows the results for all participants.



## 6.3. Task 3 – Flicker during continuous operation (real data, flicker coefficient)

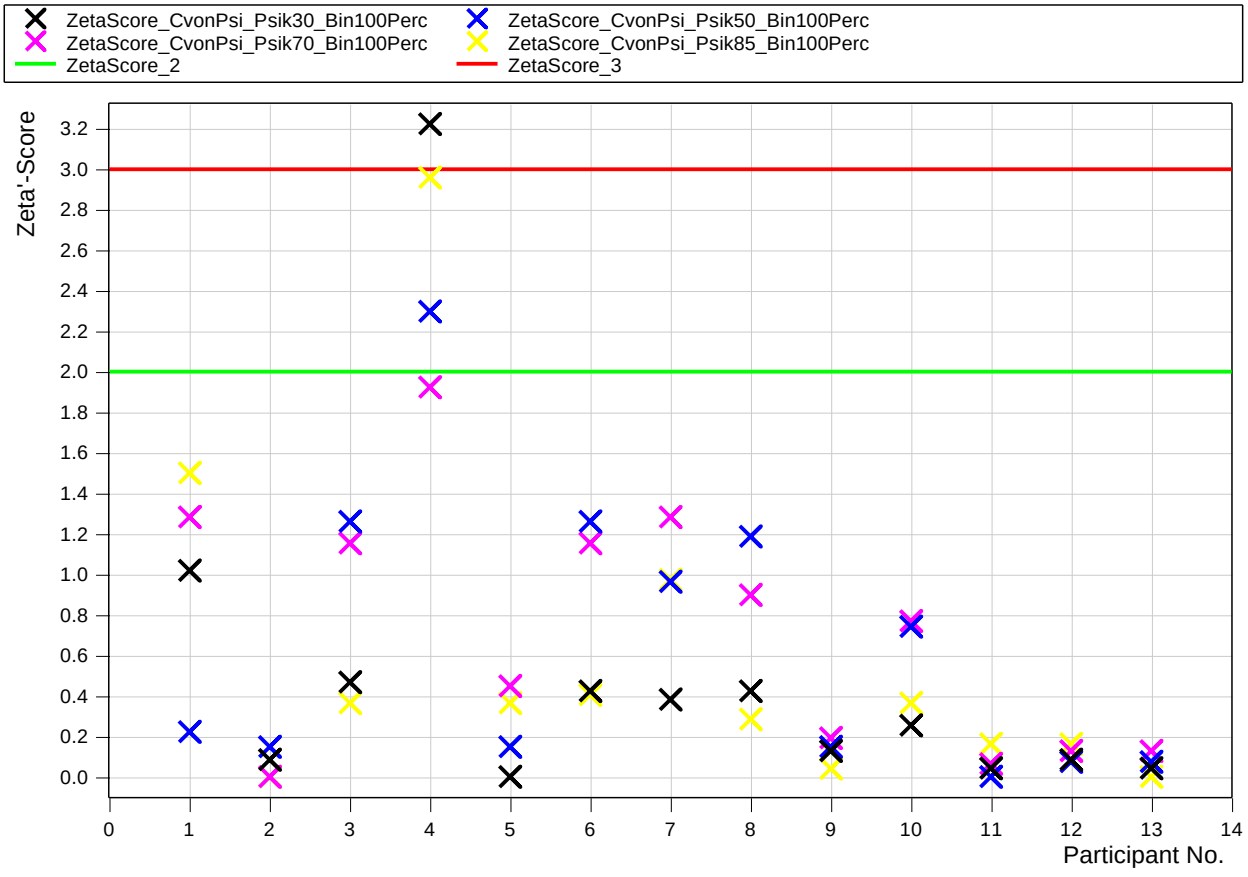
Pass/Fail Criteria: Zeta'-Score statistics according to Chapter 3.

The following table shows the results delivered by the participants and the statistics. In this task one participant is located in the red level. No participant is located in the yellow level.

| Participant | | $c(\psi_k, P_{bin})$ for 100% Bin | | | | Bin Assignment OK |
|---|---|---|---|---|---|---|
| No. | ID | $\psi_k$ = 30° | $\psi_k$ = 50° | $\psi_k$ = 70° | $\psi_k$ = 85° | |
| 1 | 0581 | 3.46 | 2.88 | 2.10 | 1.55 | Yes |
| 2 | 0857 | 3.20 | 2.83 | 2.30 | 1.92 | Yes |
| 3 | 1136 | 3.11 | 2.68 | 2.12 | 1.83 | Yes |
| 4 | 2033 | 2.46 | 2.54 | 2.60 | 2.65 | Yes |
| 5 | 2546 | 3.22 | 2.87 | 2.37 | 2.01 | Yes |
| 6 | 3866 | 3.12 | 2.68 | 2.12 | 1.82 | Yes |
| 7 | 4515 | 3.31 | 2.98 | 2.50 | 2.16 | Yes |
| 8 | 4803 | 3.12 | 2.69 | 2.16 | 1.85 | Yes |
| 9 | 6432 | 3.25 | 2.87 | 2.33 | 1.93 | Yes |
| 10 | 6805 | 3.16 | 2.75 | 2.18 | 1.83 | Yes |
| 11 | 8373 | 3.23 | 2.85 | 2.29 | 1.88 | Yes |
| 12 | 8418 | 3.24 | 2.86 | 2.32 | 1.96 | Yes |
| 13 | 8819 | 3.23 | 2.86 | 2.32 | 1.92 | Yes |
| Statistics (all participants) | Median | 3.220 | 2.850 | 2.300 | 1.920 | -- |
| | Min | 2.460 | 2.540 | 2.100 | 1.550 | -- |
| | Max | 3.460 | 2.980 | 2.600 | 2.650 | -- |
| | Standard Deviation | 0.221 | 0.114 | 0.145 | 0.242 | -- |
| Statistics (successful participants) | Median | 3.225 | 2.855 | 2.295 | 1.900 | -- |
| | Min | 3.110 | 2.680 | 2.100 | 1.550 | -- |
| | Max | 3.460 | 2.980 | 2.500 | 2.160 | -- |
| | Standard Deviation | 0.093 | 0.091 | 0.117 | 0.137 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.221 | 0.114 | 0.145 | 0.242 | -- |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.00707 | -- |
| | $\sigma_p$ | 0.081 | 0.071 | 0.058 | 0.048 | -- |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - $c(\psi_k, P_{bin})$ for 100% Bin | | | | Bin Assignment OK | Level of compliance (overall task 3) |
|---|---|---|---|---|---|---|---|
| No. | ID | $\psi_k$ = 30° | $\psi_k$ = 50° | $\psi_k$ = 70° | $\psi_k$ = 85° | | |
| 1 | 0581 | 1.02 | 0.22 | 1.28 | 1.50 | Yes | |
| 2 | 0857 | 0.08 | 0.15 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.47 | 1.26 | 1.15 | 0.36 | Yes | |
| 4 | 2033 | 3.22 | 2.30 | 1.92 | 2.96 | Yes | |
| 5 | 2546 | 0.00 | 0.15 | 0.45 | 0.36 | Yes | |
| 6 | 3866 | 0.42 | 1.26 | 1.15 | 0.41 | Yes | |
| 7 | 4515 | 0.38 | 0.96 | 1.28 | 0.97 | Yes | |
| 8 | 4803 | 0.42 | 1.19 | 0.90 | 0.28 | Yes | |
| 9 | 6432 | 0.13 | 0.15 | 0.19 | 0.04 | Yes | |
| 10 | 6805 | 0.25 | 0.74 | 0.77 | 0.36 | Yes | |
| 11 | 8373 | 0.04 | 0.00 | 0.06 | 0.16 | Yes | |
| 12 | 8418 | 0.08 | 0.07 | 0.13 | 0.16 | Yes | |
| 13 | 8819 | 0.04 | 0.07 | 0.13 | 0.00 | Yes | |



## 6.4. Task 4 – Flicker and voltage change during switching operations (real data, flicker step factor and voltage change factor)

Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3.

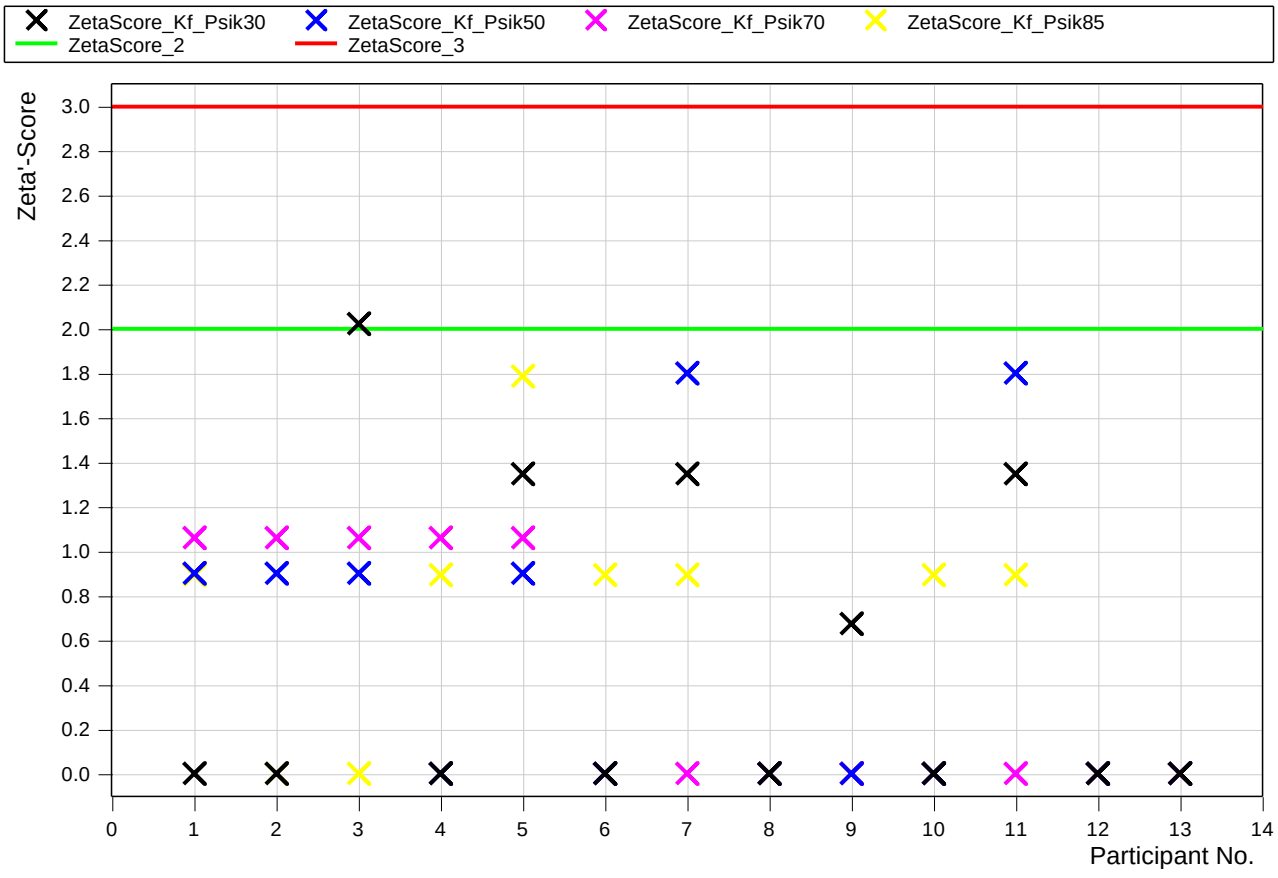
**Results for flicker step factor kf(ψk):**

The following table shows the delivered results of the participants and the corresponding statistics. In this task one participant is located in the yellow level.

| Participant | | $k_f(\psi_k)$ | | | |
|---|---|---|---|---|---|
| No. | ID | $\psi_k = 30°$ | $\psi_k = 50°$ | $\psi_k = 70°$ | $\psi_k = 85°$ |
| 1 | 0581 | 0.07 | 0.05 | 0.03 | 0.02 |
| 2 | 0857 | 0.07 | 0.05 | 0.03 | 0.03 |
| 3 | 1136 | 0.10 | 0.07 | 0.05 | 0.03 |
| 4 | 2033 | 0.07 | 0.06 | 0.05 | 0.04 |
| 5 | 2546 | 0.05 | 0.05 | 0.05 | 0.05 |
| 6 | 3866 | 0.07 | 0.06 | 0.04 | 0.02 |
| 7 | 4515 | 0.05 | 0.04 | 0.04 | 0.04 |
| 8 | 4803 | 0.07 | 0.06 | 0.04 | 0.03 |
| 9 | 6432 | 0.08 | 0.06 | 0.04 | 0.03 |
| 10 | 6805 | 0.07 | 0.06 | 0.04 | 0.02 |
| 11 | 8373 | 0.05 | 0.04 | 0.04 | 0.04 |
| 12 | 8418 | 0.07 | 0.06 | 0.04 | 0.03 |
| 13 | 8819 | 0.07 | 0.06 | 0.04 | 0.03 |
| Statistics (all participants) | Median | 0.07 | 0.06 | 0.04 | 0.03 |
| | Min | 0.05 | 0.04 | 0.03 | 0.02 |
| | Max | 0.10 | 0.07 | 0.05 | 0.05 |
| | Standard Deviation | 0.013 | 0.008 | 0.006 | 0.009 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.013 | 0.008 | 0.006 | 0.009 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.002 | 0.002 | 0.001 | 0.001 |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - $k_f(\psi_k)$ | | | | Level of compliance (overall task 4, kf results) |
|---|---|---|---|---|---|---|
| No. | ID | $\psi_k$ = 30° | $\psi_k$ = 50° | $\psi_k$ = 70° | $\psi_k$ = 85° | |
| 1 | 0581 | 0.00 | 0.90 | 1.06 | 0.89 | |
| 2 | 0857 | 0.00 | 0.90 | 1.06 | 0.00 | |
| 3 | 1136 | 2.02 | 0.90 | 1.06 | 0.00 | |
| 4 | 2033 | 0.00 | 0.00 | 1.06 | 0.89 | |
| 5 | 2546 | 1.35 | 0.90 | 1.06 | 1.79 | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.89 | |
| 7 | 4515 | 1.35 | 1.80 | 0.00 | 0.89 | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 9 | 6432 | 0.67 | 0.00 | 0.00 | 0.00 | |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.89 | |
| 11 | 8373 | 1.35 | 1.80 | 0.00 | 0.89 | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | |



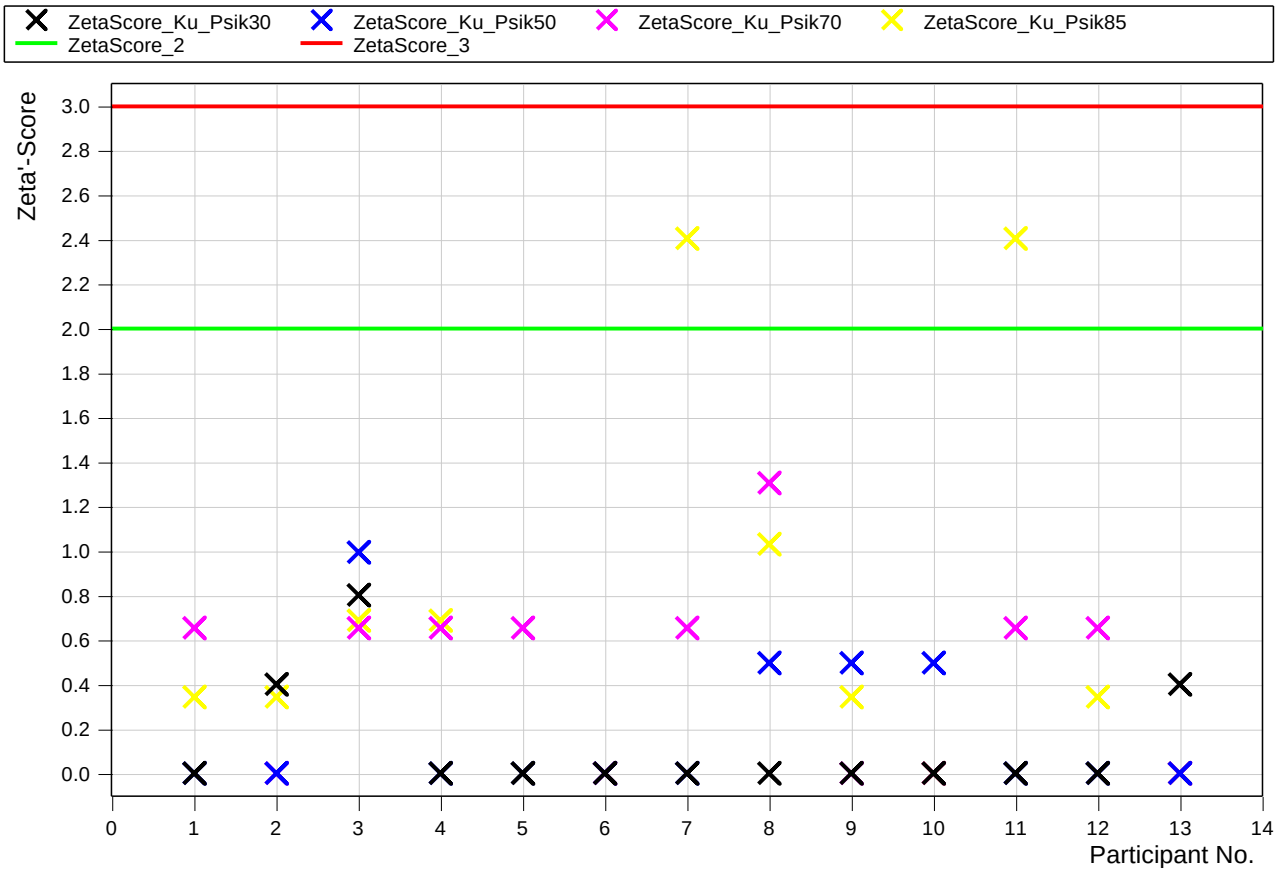
**Results for voltage change factor ku(ψk):**

The following table shows the delivered results of the participants and the corresponding statistics. In this task two participants are located in the yellow level.

| Participant | | $k_u(\psi_k)$ | | | |
|---|---|---|---|---|---|
| No. | ID | $\psi_k = 30°$ | $\psi_k = 50°$ | $\psi_k = 70°$ | $\psi_k = 85°$ |
| 1 | 0581 | 0.92 | 0.70 | 0.40 | 0.14 |
| 2 | 0857 | 0.91 | 0.70 | 0.41 | 0.16 |
| 3 | 1136 | 0.94 | 0.72 | 0.42 | 0.17 |
| 4 | 2033 | 0.92 | 0.70 | 0.40 | 0.17 |
| 5 | 2546 | 0.92 | 0.70 | 0.40 | 0.15 |
| 6 | 3866 | 0.92 | 0.70 | 0.41 | 0.15 |
| 7 | 4515 | 0.92 | 0.70 | 0.42 | 0.22 |
| 8 | 4803 | 0.92 | 0.69 | 0.39 | 0.12 |
| 9 | 6432 | 0.92 | 0.71 | 0.41 | 0.16 |
| 10 | 6805 | 0.92 | 0.71 | 0.41 | 0.15 |
| 11 | 8373 | 0.92 | 0.70 | 0.42 | 0.22 |
| 12 | 8418 | 0.92 | 0.70 | 0.40 | 0.14 |
| 13 | 8819 | 0.93 | 0.70 | 0.41 | 0.15 |
| Statistics (all participants) | Median | 0.92 | 0.70 | 0.41 | 0.15 |
| | Min | 0.91 | 0.69 | 0.39 | 0.12 |
| | Max | 0.94 | 0.72 | 0.42 | 0.22 |
| | Standard Deviation | 0.007 | 0.007 | 0.009 | 0.028 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.007 | 0.007 | 0.009 | 0.028 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.023 | 0.018 | 0.010 | 0.004 |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - $k_u(\psi_k)$ | | | | Level of compliance (overall task 4, ku results) |
|---|---|---|---|---|---|---|
| No. | ID | $\psi_k$ = 30° | $\psi_k$ = 50° | $\psi_k$ = 70° | $\psi_k$ = 85° | |
| 1 | 0581 | 0.00 | 0.00 | 0.65 | 0.34 | |
| 2 | 0857 | 0.40 | 0.00 | 0.00 | 0.34 | |
| 3 | 1136 | 0.80 | 0.99 | 0.65 | 0.69 | |
| 4 | 2033 | 0.00 | 0.00 | 0.65 | 0.69 | |
| 5 | 2546 | 0.00 | 0.00 | 0.65 | 0.00 | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7 | 4515 | 0.00 | 0.00 | 0.65 | 2.41 | |
| 8 | 4803 | 0.00 | 0.50 | 1.31 | 1.03 | |
| 9 | 6432 | 0.00 | 0.50 | 0.00 | 0.34 | |
| 10 | 6805 | 0.00 | 0.50 | 0.00 | 0.00 | |
| 11 | 8373 | 0.00 | 0.00 | 0.65 | 2.41 | |
| 12 | 8418 | 0.00 | 0.00 | 0.65 | 0.34 | |
| 13 | 8819 | 0.40 | 0.00 | 0.00 | 0.00 | |



## 6.5. Task 5 – Harmonics, interharmonics, higher frequency components (synthetic data)

Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3 and assigned value as known value from synthetic data. According to [2], harmonic currents below 0.1% of $I_n$ for any of the harmonic orders do not need to be reported. They are typically below the measurement accuracy and may be considered as measurement noise (Chapter 8.2.4.3 [2]). The values were evaluated as follows:

- if the assigned value is ≥0.1% of $I_n$ the participants' result will be considered in the level of compliance.
- if the assigned value is <0.1% of $I_n$ the participants' result will be considered informative. This values are shown in grey background.

The following synthetic harmonic components were generated and used as known assigned values for evaluation (grouping of the values must be considered):

| Frequency [Hz] | % of In | Setting in software: I – rms value in A | Frequency [Hz] | % of In | Setting in software: I – rms value in A |
|---|---|---|---|---|---|
| 50 | 100 | 2328.025278990430 | 1200 | 1.100 | 25.608278068895 |
| 75 | 1.225 | 28.518309667633 | 1325 | 1.600 | 37.248404463847 |
| 195 | 1.000 | 23.280252789904 | 1550 | 1.800 | 41.904455021828 |
| 200 | 1.414 | 32.923249230957 | 1575 | 1.050 | 24.444265429400 |
| 205 | 1.000 | 23.280252789904 | 1800 | 1.500 | 34.920379184856 |
| 210 | 1.000 | 23.280252789904 | 1875 | 1.475 | 34.338372865109 |
| 215 | 1.000 | 23.280252789904 | 1925 | 1.700 | 39.576429742837 |
| 220 | 1.000 | 23.280252789904 | 2000 | 1.500 | 34.920379184856 |
| 225 | 1.732 | 40.322580645886 | 2100 | 1.000 | 23.280252789904 |
| 230 | 1.000 | 23.280252789904 | 2250 | 1.750 | 40.740442382333 |
| 235 | 1.000 | 23.280252789904 | 2500 | 1.250 | 29.100315987380 |
| 240 | 1.000 | 23.280252789904 | 3100 | 1.400 | 32.592353905866 |
| 425 | 1.875 | 43.650473981071 | 4300 | 1.600 | 37.248404463847 |
| 550 | 1.500 | 34.920379184856 | 5100 | 1.125 | 26.190284388642 |
| 675 | 1.100 | 25.608278068895 | 6500 | 1.350 | 31.428341266371 |
| 800 | 1.900 | 44.232480300818 | 7205 | 1.000 | 23.280252789904 |
| 925 | 1.350 | 31.428341266371 | 7300 | 1.414 | 32.923249230957 |
| 950 | 1.500 | 34.920379184856 | 7400 | 1.000 | 23.280252789904 |
| 1075 | 1.700 | 39.576429742837 | 8700 | 1.650 | 38.412417103342 |

**Task 5.1 (Harmonics)**

The following table shows the delivered results of the participants and the corresponding statistics. In this task no participant is located in the red level. Four participants are located in the yellow level. Values with grey background are only informative, and not considered for the evaluation of the level of compliance.

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 2 | h = 3 | h = 4 | h = 5 | h = 6 | h = 7 | h = 8 | h = 9 | h = 10 |
| 1 | 0581 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | 1136 | 0.002 | 0.001 | 2.000 | 0.002 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 |
| 4 | 2033 | 0.022 | 0.022 | 2.015 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 |
| 5 | 2546 | 0.022 | 0.022 | 2.015 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 |
| 6 | 3866 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 6432 | 0.001 | 0.001 | 1.999 | 0.000 | 0.001 | 0.000 | 0.001 | 0.003 | 0.001 |
| 10 | 6805 | 0.001 | 0.001 | 2.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.001 | 0.000 |
| 11 | 8373 | 0.000 | 0.000 | 1.999 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 |
| 12 | 8418 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 2.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | Min | 0.000 | 0.000 | 1.999 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | Max | 0.022 | 0.022 | 2.015 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 | 0.022 |
| | Standard Deviation | 0.008 | 0.008 | 0.005 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.008 | 0.008 | 0.005 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 | 0.008 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 11 | h = 12 | h = 13 | h = 14 | h = 15 | h = 16 | h = 17 | h = 18 | h = 19 |
| 1 | 0581 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| 2 | 0857 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| 3 | 1136 | 1.500 | 0.001 | 0.000 | 0.001 | 0.001 | 1.900 | 0.000 | 0.002 | 1.500 |
| 4 | 2033 | 1.507 | 0.022 | 0.022 | 0.022 | 0.022 | 1.906 | 0.022 | 0.022 | 1.506 |
| 5 | 2546 | 1.507 | 0.022 | 0.022 | 0.022 | 0.022 | 1.906 | 0.022 | 0.022 | 1.506 |
| 6 | 3866 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| 7 | 4515 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| 8 | 4803 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| 9 | 6432 | 1.496 | 0.005 | 0.000 | 0.002 | 0.000 | 1.889 | 0.006 | 0.001 | 1.488 |
| 10 | 6805 | 1.500 | 0.000 | 0.001 | 0.001 | 0.000 | 1.900 | 0.001 | 0.001 | 1.500 |
| 11 | 8373 | 1.496 | 0.000 | 0.000 | 0.000 | 0.000 | 1.890 | 0.000 | 0.000 | 1.489 |
| 12 | 8418 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| 13 | 8819 | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| Statistics (all participants) | Assigned value | 1.500 | 0.000 | 0.000 | 0.000 | 0.000 | 1.900 | 0.000 | 0.000 | 1.500 |
| | Min | 1.496 | 0.000 | 0.000 | 0.000 | 0.000 | 1.889 | 0.000 | 0.000 | 1.488 |
| | Max | 1.507 | 0.022 | 0.022 | 0.022 | 0.022 | 1.906 | 0.022 | 0.022 | 1.506 |
| | Standard Deviation | 0.003 | 0.008 | 0.008 | 0.008 | 0.008 | 0.005 | 0.008 | 0.008 | 0.005 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.003 | 0.008 | 0.008 | 0.008 | 0.008 | 0.005 | 0.008 | 0.008 | 0.005 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 20 | h = 21 | h = 22 | h = 23 | h = 24 | h = 25 | h = 26 | h = 27 | h = 28 |
| 1 | 0581 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | 1136 | 0.002 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.001 | 0.001 | 0.000 |
| 4 | 2033 | 0.022 | 0.022 | 0.022 | 0.022 | 1.106 | 0.022 | 0.022 | 0.022 | 0.022 |
| 5 | 2546 | 0.022 | 0.022 | 0.022 | 0.022 | 1.106 | 0.022 | 0.022 | 0.022 | 0.022 |
| 6 | 3866 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 6432 | 0.000 | 0.000 | 0.005 | 0.001 | 1.087 | 0.000 | 0.000 | 0.000 | 0.011 |
| 10 | 6805 | 0.001 | 0.002 | 0.001 | 0.001 | 1.100 | 0.001 | 0.001 | 0.002 | 0.001 |
| 11 | 8373 | 0.000 | 0.000 | 0.000 | 0.000 | 1.087 | 0.000 | 0.000 | 0.000 | 0.000 |
| 12 | 8418 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 |
| | Min | 0.000 | 0.000 | 0.000 | 0.000 | 1.087 | 0.000 | 0.000 | 0.000 | 0.000 |
| | Max | 0.022 | 0.022 | 0.022 | 0.022 | 1.106 | 0.022 | 0.022 | 0.022 | 0.022 |
| | Standard Deviation | 0.008 | 0.008 | 0.008 | 0.008 | 0.006 | 0.008 | 0.008 | 0.008 | 0.008 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.008 | 0.008 | 0.008 | 0.008 | 0.006 | 0.008 | 0.008 | 0.008 | 0.008 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 29 | h = 30 | h = 31 | h = 32 | h = 33 | h = 34 | h = 35 | h = 36 | h = 37 |
| 1 | 0581 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| 3 | 1136 | 0.001 | 0.000 | 1.800 | 0.001 | 0.003 | 0.000 | 0.000 | 1.500 | 0.001 |
| 4 | 2033 | 0.022 | 0.022 | 1.804 | 0.022 | 0.022 | 0.022 | 0.022 | 1.503 | 0.022 |
| 5 | 2546 | 0.022 | 0.022 | 1.804 | 0.022 | 0.022 | 0.022 | 0.022 | 1.503 | 0.022 |
| 6 | 3866 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| 9 | 6432 | 0.013 | 0.001 | 1.764 | 0.000 | 0.000 | 0.002 | 0.000 | 1.460 | 0.000 |
| 10 | 6805 | 0.000 | 0.001 | 1.800 | 0.001 | 0.001 | 0.001 | 0.001 | 1.500 | 0.003 |
| 11 | 8373 | 0.001 | 0.000 | 1.764 | 0.000 | 0.000 | 0.001 | 0.000 | 1.460 | 0.000 |
| 12 | 8418 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 1.800 | 0.000 | 0.000 | 0.000 | 0.000 | 1.500 | 0.000 |
| | Min | 0.000 | 0.000 | 1.764 | 0.000 | 0.000 | 0.000 | 0.000 | 1.460 | 0.000 |
| | Max | 0.022 | 0.022 | 1.804 | 0.022 | 0.022 | 0.022 | 0.022 | 1.503 | 0.022 |
| | Standard Deviation | 0.008 | 0.008 | 0.013 | 0.008 | 0.008 | 0.008 | 0.008 | 0.015 | 0.008 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.008 | 0.008 | 0.013 | 0.008 | 0.008 | 0.008 | 0.008 | 0.015 | 0.008 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 38 | h = 39 | h = 40 | h = 41 | h = 42 | h = 43 | h = 44 | h = 45 | h = 46 |
| 1 | 0581 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| 3 | 1136 | 0.000 | 0.001 | 1.500 | 0.000 | 1.000 | 0.001 | 0.001 | 1.750 | 0.003 |
| 4 | 2033 | 0.022 | 0.022 | 1.503 | 0.022 | 1.003 | 0.022 | 0.022 | 1.751 | 0.022 |
| 5 | 2546 | 0.022 | 0.022 | 1.503 | 0.022 | 1.003 | 0.022 | 0.022 | 1.751 | 0.022 |
| 6 | 3866 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| 9 | 6432 | 0.002 | 0.000 | 1.451 | 0.008 | 0.964 | 0.000 | 0.000 | 1.678 | 0.001 |
| 10 | 6805 | 0.001 | 0.003 | 1.500 | 0.001 | 1.000 | 0.001 | 0.002 | 1.750 | 0.001 |
| 11 | 8373 | 0.000 | 0.000 | 1.451 | 0.000 | 0.964 | 0.000 | 0.000 | 1.678 | 0.000 |
| 12 | 8418 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 1.500 | 0.000 | 1.000 | 0.000 | 0.000 | 1.750 | 0.000 |
| | Min | 0.000 | 0.000 | 1.451 | 0.000 | 0.964 | 0.000 | 0.000 | 1.678 | 0.000 |
| | Max | 0.022 | 0.022 | 1.503 | 0.022 | 1.003 | 0.022 | 0.022 | 1.751 | 0.022 |
| | Standard Deviation | 0.008 | 0.008 | 0.018 | 0.008 | 0.013 | 0.008 | 0.008 | 0.026 | 0.008 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.008 | 0.008 | 0.018 | 0.008 | 0.013 | 0.008 | 0.008 | 0.026 | 0.008 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | |
|---|---|---|---|---|---|---|
| No. | ID | h = 47 | h = 48 | h = 49 | h = 50 | Bin assignment OK |
| 1 | 0581 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| 2 | 0857 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| 3 | 1136 | 0.000 | 0.000 | 0.001 | 1.250 | Yes |
| 4 | 2033 | 0.022 | 0.022 | 0.022 | 1.251 | Yes |
| 5 | 2546 | 0.022 | 0.022 | 0.022 | 1.251 | Yes |
| 6 | 3866 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| 7 | 4515 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| 8 | 4803 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| 9 | 6432 | 0.015 | 0.019 | 0.000 | 1.188 | Yes |
| 10 | 6805 | 0.001 | 0.001 | 0.001 | 1.250 | Yes |
| 11 | 8373 | 0.000 | 0.001 | 0.000 | 1.187 | Yes |
| 12 | 8418 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| 13 | 8819 | 0.000 | 0.000 | 0.000 | 1.250 | Yes |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 0.000 | 1.250 | -- |
| | Min | 0.000 | 0.000 | 0.000 | 1.187 | -- |
| | Max | 0.022 | 0.022 | 0.022 | 1.251 | -- |
| | Standard Deviation | 0.008 | 0.009 | 0.008 | 0.023 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.008 | 0.009 | 0.008 | 0.023 | -- |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | -- |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | -- |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 2 | h = 3 | h = 4 | h = 5 | h = 6 | h = 7 | h = 8 | h = 9 | h = 10 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.25 | 0.13 | 0.00 | 0.25 | 0.13 | 0.25 | 0.13 | 0.00 | 0.00 |
| 4 | 2033 | 2.80 | 2.79 | 2.71 | 2.79 | 2.79 | 2.78 | 2.79 | 2.79 | 2.78 |
| 5 | 2546 | 2.80 | 2.79 | 2.71 | 2.79 | 2.79 | 2.78 | 2.79 | 2.79 | 2.78 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.13 | 0.13 | 0.18 | 0.00 | 0.13 | 0.00 | 0.13 | 0.38 | 0.13 |
| 10 | 6805 | 0.13 | 0.13 | 0.00 | 0.13 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.18 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.13 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

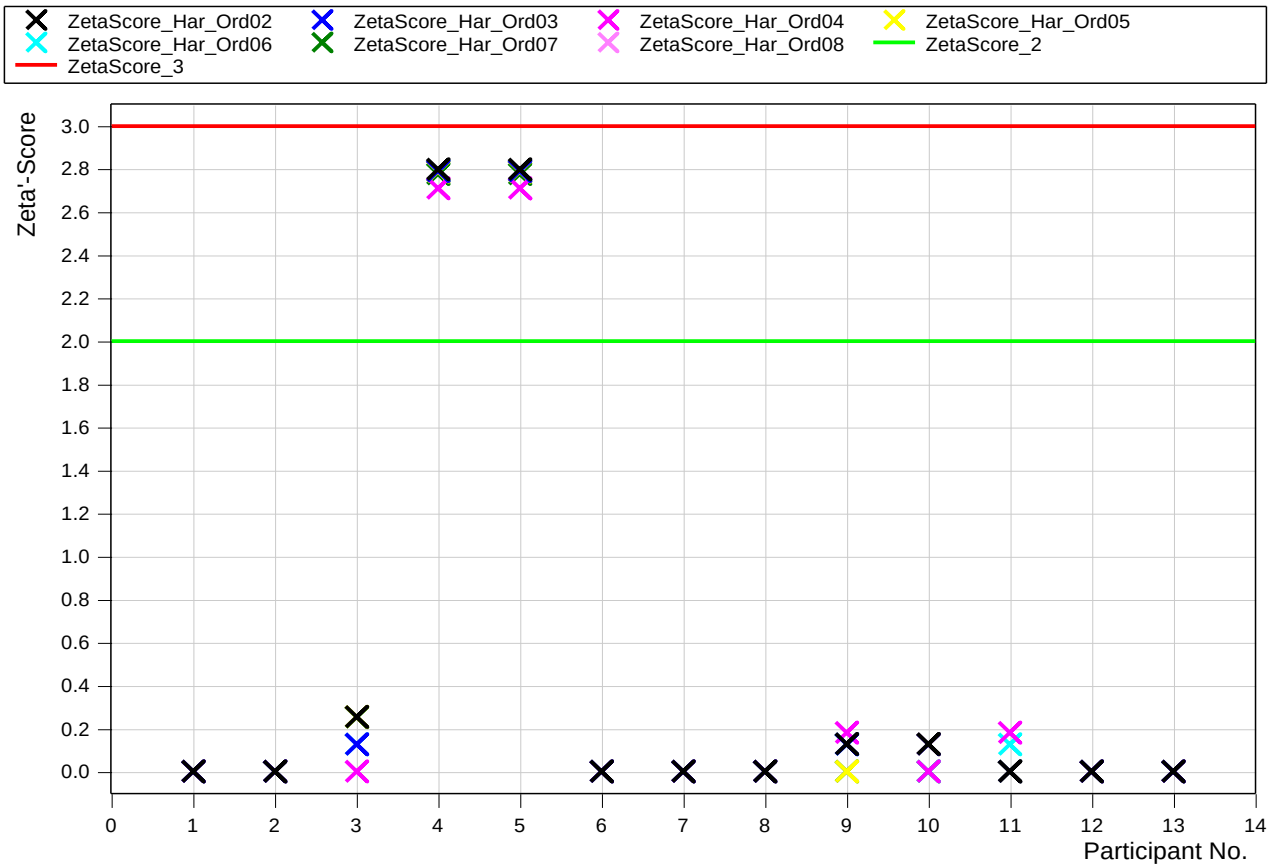
| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 11 | h = 12 | h = 13 | h = 14 | h = 15 | h = 16 | h = 17 | h = 18 | h = 19 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.13 | 0.00 | 0.13 | 0.13 | 0.00 | 0.00 | 0.25 | 0.00 |
| 4 | 2033 | 2.18 | 2.79 | 2.77 | 2.80 | 2.77 | 1.26 | 2.78 | 2.80 | 1.18 |
| 5 | 2546 | 2.18 | 2.79 | 2.77 | 2.80 | 2.77 | 1.26 | 2.78 | 2.80 | 1.18 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 1.25 | 0.63 | 0.00 | 0.25 | 0.00 | 2.32 | 0.76 | 0.13 | 2.37 |
| 10 | 6805 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 |
| 11 | 8373 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 2.11 | 0.00 | 0.00 | 2.17 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 20 | h = 21 | h = 22 | h = 23 | h = 24 | h = 25 | h = 26 | h = 27 | h = 28 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 |
| 4 | 2033 | 2.79 | 2.78 | 2.79 | 2.78 | 1.08 | 2.77 | 2.78 | 2.79 | 2.71 |
| 5 | 2546 | 2.79 | 2.78 | 2.79 | 2.78 | 1.08 | 2.77 | 2.78 | 2.79 | 2.71 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.63 | 0.13 | 2.34 | 0.00 | 0.00 | 0.00 | 1.36 |
| 10 | 6805 | 0.13 | 0.25 | 0.13 | 0.13 | 0.00 | 0.13 | 0.13 | 0.25 | 0.12 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 2.34 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 29 | h = 30 | h = 31 | h = 32 | h = 33 | h = 34 | h = 35 | h = 36 | h = 37 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.12 | 0.00 | 0.00 | 0.13 | 0.38 | 0.00 | 0.00 | 0.00 | 0.13 |
| 4 | 2033 | 2.68 | 2.78 | 0.30 | 2.78 | 2.79 | 2.80 | 2.77 | 0.20 | 2.79 |
| 5 | 2546 | 2.68 | 2.78 | 0.30 | 2.78 | 2.79 | 2.80 | 2.77 | 0.20 | 2.79 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 1.58 | 0.13 | 2.70 | 0.00 | 0.00 | 0.25 | 0.00 | 2.72 | 0.00 |
| 10 | 6805 | 0.00 | 0.13 | 0.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.00 | 0.38 |
| 11 | 8373 | 0.12 | 0.00 | 2.70 | 0.00 | 0.00 | 0.13 | 0.00 | 2.72 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 38 | h = 39 | h = 40 | h = 41 | h = 42 | h = 43 | h = 44 | h = 45 | h = 46 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.13 | 0.13 | 0.00 | 0.38 |
| 4 | 2033 | 2.79 | 2.79 | 0.17 | 2.76 | 0.23 | 2.78 | 2.79 | 0.04 | 2.80 |
| 5 | 2546 | 2.79 | 2.79 | 0.17 | 2.76 | 0.23 | 2.78 | 2.79 | 0.04 | 2.80 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.25 | 0.00 | 2.73 | 1.01 | 2.72 | 0.00 | 0.00 | 2.76 | 0.13 |
| 10 | 6805 | 0.13 | 0.38 | 0.00 | 0.13 | 0.00 | 0.13 | 0.25 | 0.00 | 0.13 |
| 11 | 8373 | 0.00 | 0.00 | 2.73 | 0.00 | 2.72 | 0.00 | 0.00 | 2.76 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | |
|---|---|---|---|---|---|---|---|
| No. | ID | h = 47 | h = 48 | h = 49 | h = 50 | Bin assignment OK | Level of compliance (overall task 5.1) |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.00 | 0.00 | 0.13 | 0.00 | Yes | |
| 4 | 2033 | 2.61 | 2.49 | 2.78 | 0.04 | Yes | |
| 5 | 2546 | 2.61 | 2.49 | 2.78 | 0.04 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 1.78 | 2.15 | 0.00 | 2.74 | Yes | |
| 10 | 6805 | 0.12 | 0.11 | 0.13 | 0.00 | Yes | |
| 11 | 8373 | 0.00 | 0.11 | 0.00 | 2.78 | Yes | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |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ZetaScore_Har_Ord03
ZetaScore_Har_Ord04
ZetaScore_Har_Ord05
ZetaScore_Har_Ord06
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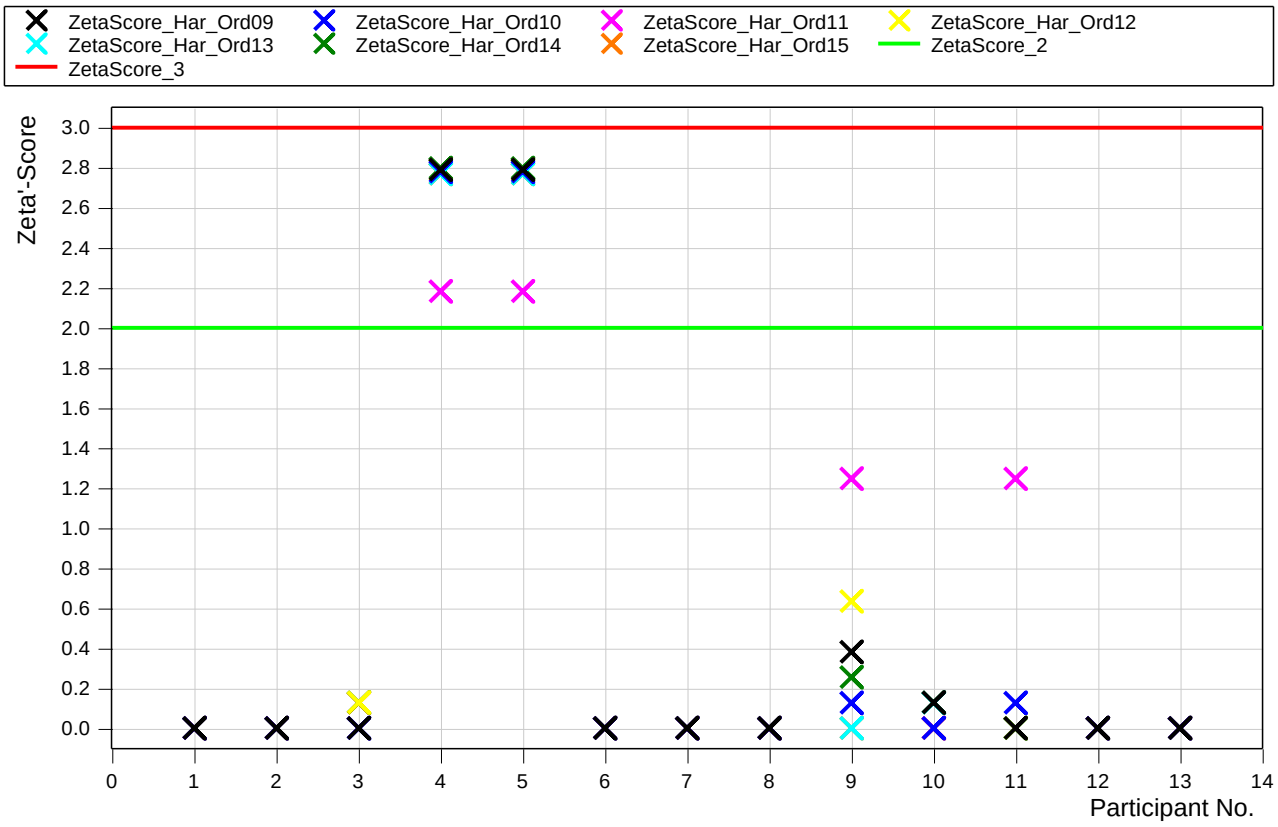
ZetaScore_Har_Ord08
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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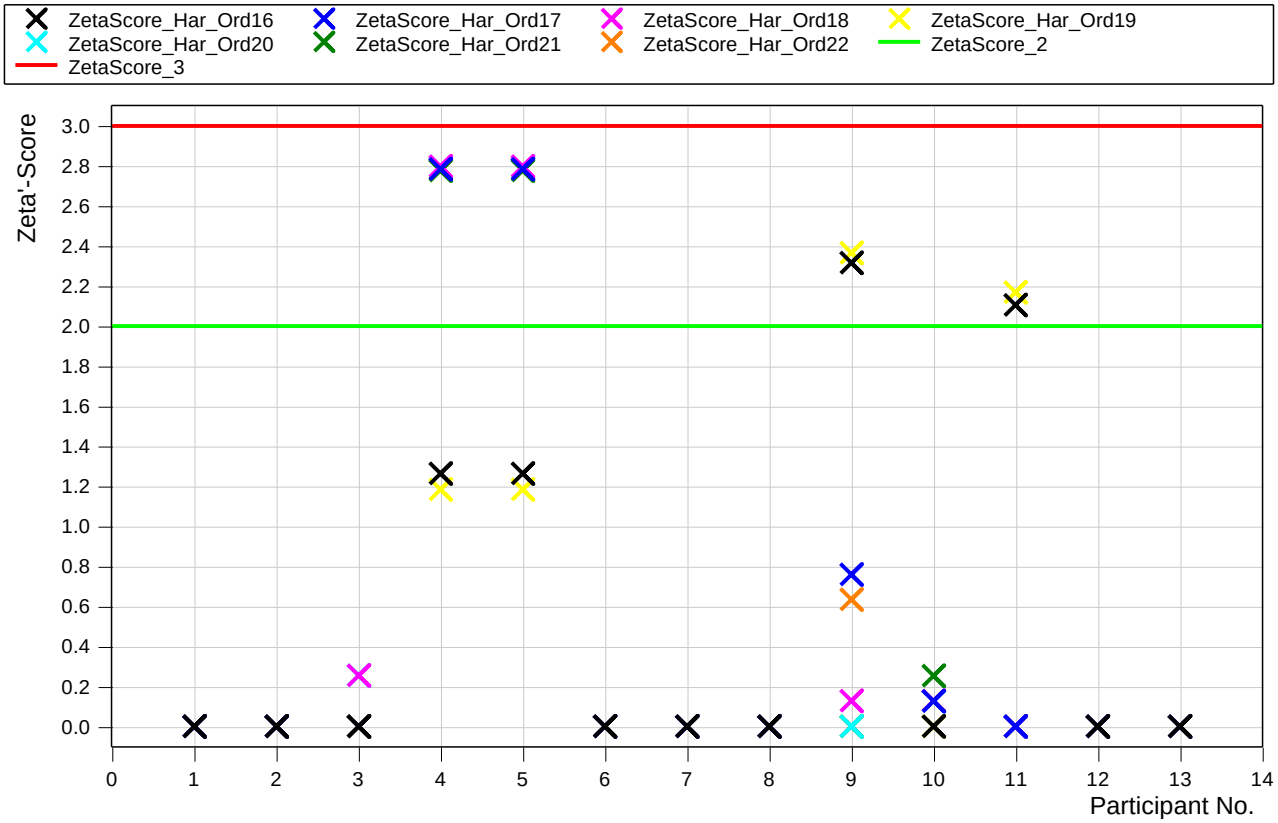
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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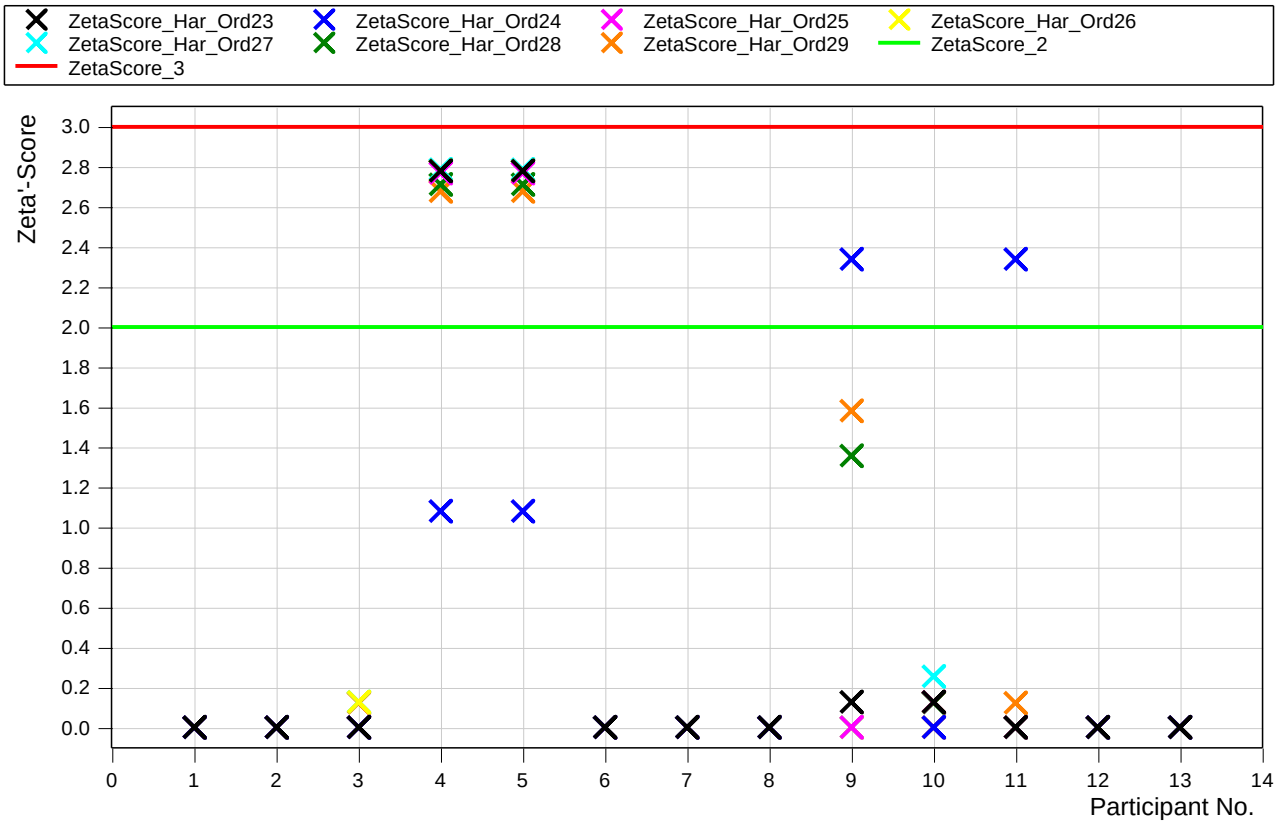
ZetaScore_Har_Ord22
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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ZetaScore_Har_Ord26
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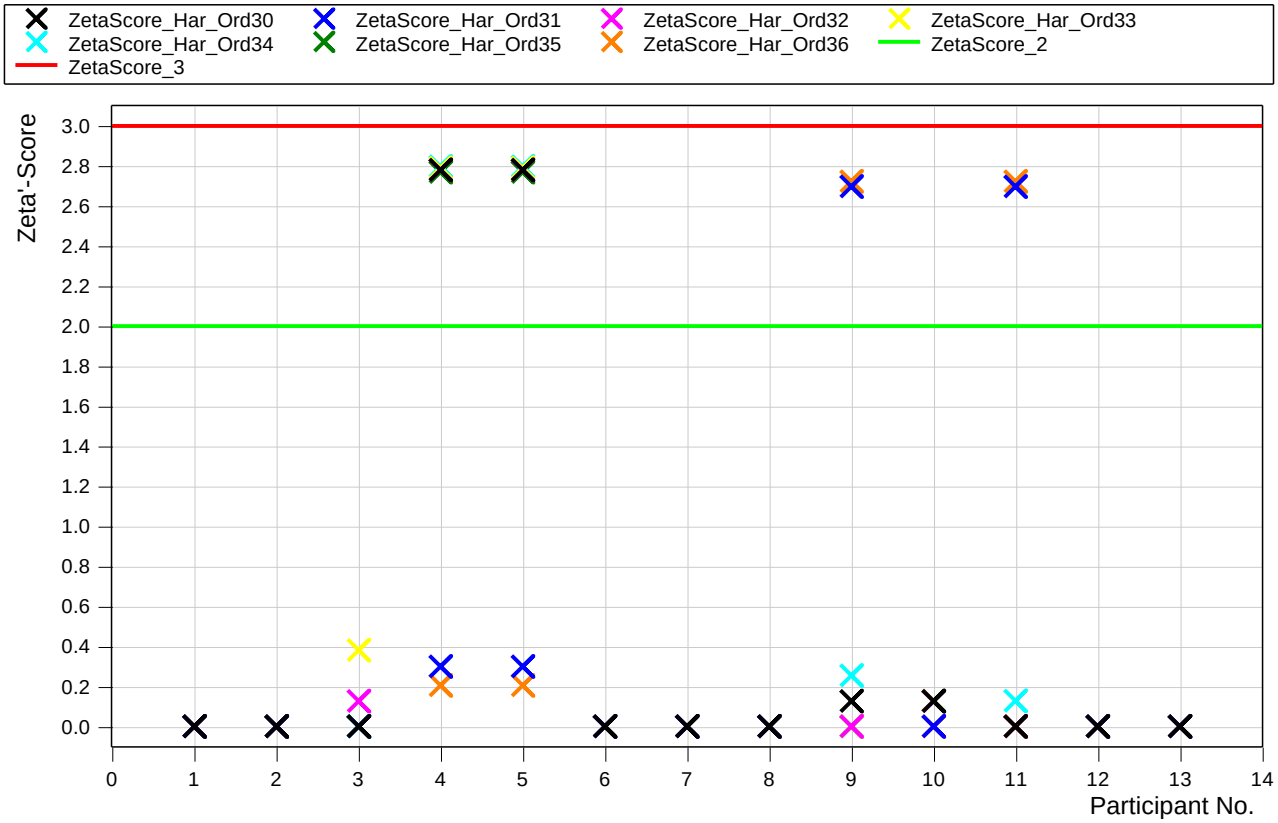
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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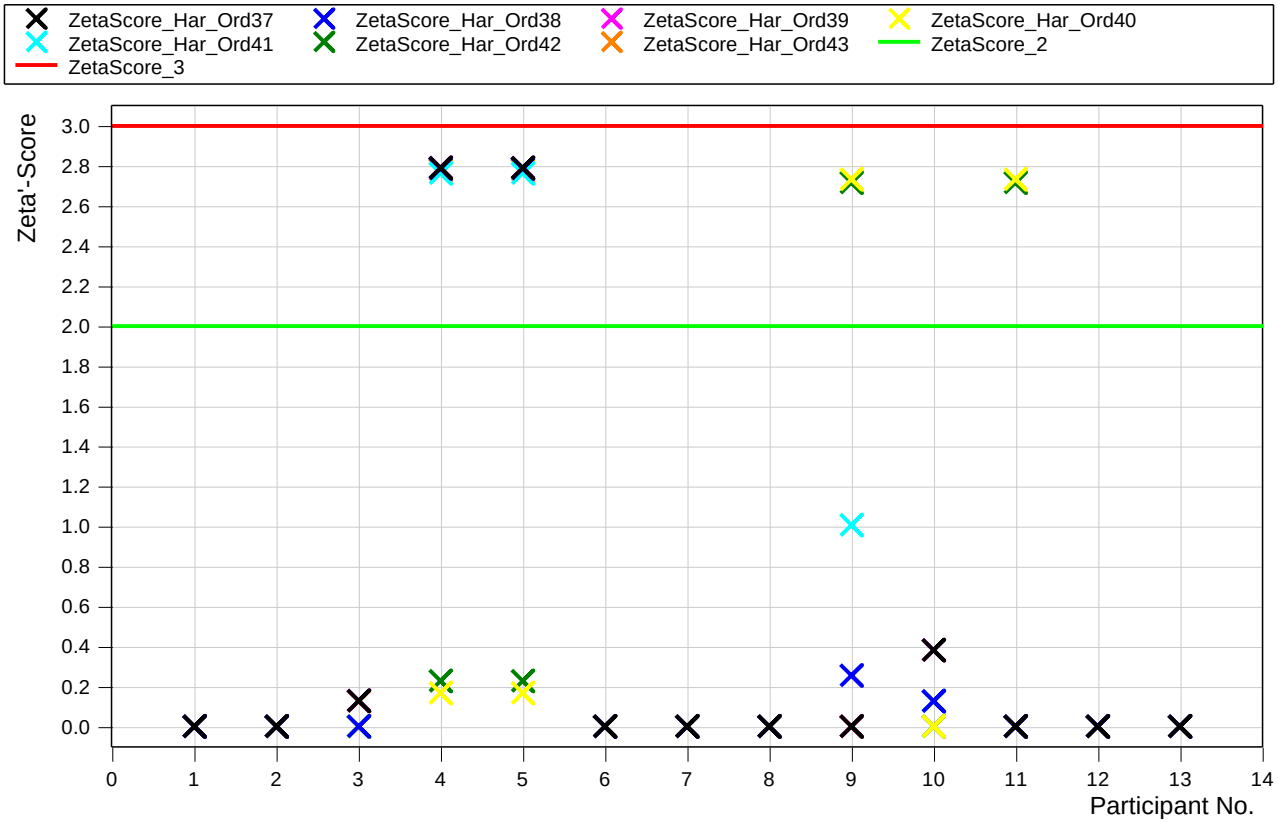
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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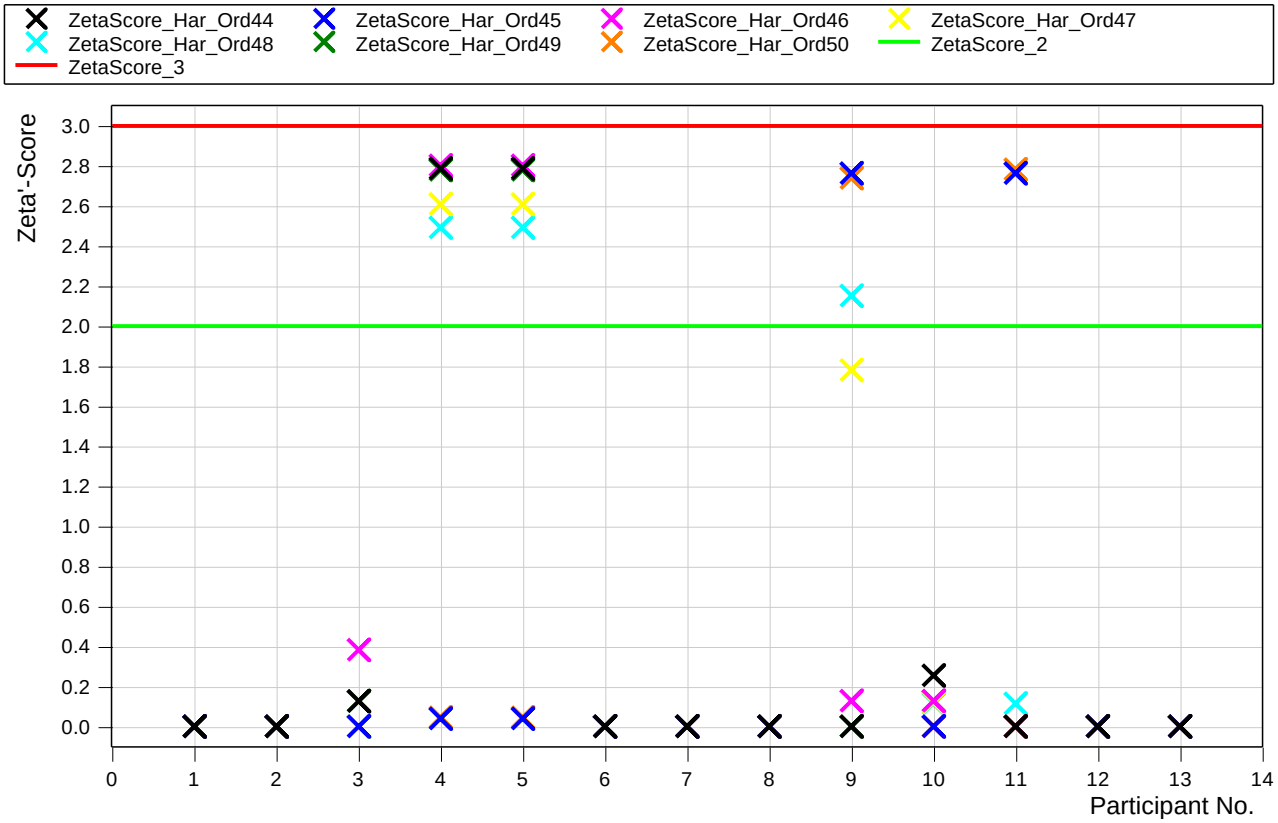
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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ZetaScore_Har_Ord47
ZetaScore_Har_Ord48
ZetaScore_Har_Ord49
ZetaScore_Har_Ord50
ZetaScore_2
ZetaScore_3
Zeta'-Score
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Participant No.

**Task 5.2 (Interharmonics)**

The following table shows the delivered results of the participants and the corresponding statistics. In this task no participant is located in the red level. Four participants are located in the yellow level. Values with grey background are only informative and not considered for the evaluation of the level of compliance.

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 75 Hz | f = 125 Hz | f = 175 Hz | f = 225 Hz | f = 275 Hz | f = 325 Hz | f = 375 Hz | f = 425 Hz | f = 475 Hz |
| 1 | 0581 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| 2 | 0857 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| 3 | 1136 | 1.225 | 0.001 | 0.004 | 3.000 | 0.005 | 0.001 | 0.004 | 1.875 | 0.001 |
| 4 | 2033 | 1.236 | 0.034 | 0.034 | 3.027 | 0.034 | 0.034 | 0.034 | 1.885 | 0.034 |
| 5 | 2546 | 1.236 | 0.034 | 0.034 | 3.027 | 0.034 | 0.034 | 0.034 | 1.885 | 0.034 |
| 6 | 3866 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| 7 | 4515 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| 8 | 4803 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| 9 | 6432 | 1.225 | 0.002 | 0.001 | 2.998 | 0.002 | 0.003 | 0.003 | 1.872 | 0.004 |
| 10 | 6805 | 1.225 | 0.001 | 0.001 | 3.000 | 0.001 | 0.001 | 0.001 | 1.875 | 0.000 |
| 11 | 8373 | 1.225 | 0.001 | 0.001 | 2.999 | 0.000 | 0.001 | 0.002 | 1.872 | 0.001 |
| 12 | 8418 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| 13 | 8819 | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| Statistics (all participants) | Assigned value | 1.225 | 0.000 | 0.000 | 3.000 | 0.000 | 0.000 | 0.000 | 1.875 | 0.000 |
| | Min | 1.225 | 0.000 | 0.000 | 2.998 | 0.000 | 0.000 | 0.000 | 1.872 | 0.000 |
| | Max | 1.236 | 0.034 | 0.034 | 3.027 | 0.034 | 0.034 | 0.034 | 1.885 | 0.034 |
| | Standard Deviation | 0.004 | 0.012 | 0.012 | 0.010 | 0.012 | 0.012 | 0.012 | 0.004 | 0.012 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.004 | 0.012 | 0.012 | 0.010 | 0.012 | 0.012 | 0.012 | 0.004 | 0.012 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 525 Hz | f = 575 Hz | f = 625 Hz | f = 675 Hz | f = 725 Hz | f = 775 Hz | f = 825 Hz | f = 875 Hz | f = 925 Hz |
| 1 | 0581 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| 2 | 0857 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| 3 | 1136 | 0.005 | 0.001 | 0.000 | 1.100 | 0.001 | 0.001 | 0.001 | 0.001 | 1.350 |
| 4 | 2033 | 0.034 | 0.034 | 0.034 | 1.110 | 0.034 | 0.034 | 0.034 | 0.034 | 1.359 |
| 5 | 2546 | 0.034 | 0.034 | 0.034 | 1.110 | 0.034 | 0.034 | 0.034 | 0.034 | 1.359 |
| 6 | 3866 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| 7 | 4515 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| 8 | 4803 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| 9 | 6432 | 0.001 | 0.003 | 0.002 | 1.096 | 0.004 | 0.001 | 0.004 | 0.001 | 1.340 |
| 10 | 6805 | 0.001 | 0.001 | 0.000 | 1.100 | 0.001 | 0.002 | 0.003 | 0.001 | 1.350 |
| 11 | 8373 | 0.000 | 0.003 | 0.002 | 1.096 | 0.001 | 0.000 | 0.003 | 0.000 | 1.340 |
| 12 | 8418 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| 13 | 8819 | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 0.000 | 1.100 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 |
| | Min | 0.000 | 0.000 | 0.000 | 1.096 | 0.000 | 0.000 | 0.000 | 0.000 | 1.340 |
| | Max | 0.034 | 0.034 | 0.034 | 1.110 | 0.034 | 0.034 | 0.034 | 0.034 | 1.359 |
| | Standard Deviation | 0.012 | 0.012 | 0.012 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.005 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.012 | 0.012 | 0.012 | 0.004 | 0.012 | 0.012 | 0.012 | 0.012 | 0.005 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 975 Hz | f = 1,025 Hz | f = 1,075 Hz | f = 1,125 Hz | f = 1,175 Hz | f = 1,225 Hz | f = 1,275 Hz | f = 1,325 Hz | f = 1,375 Hz |
| 1 | 0581 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| 3 | 1136 | 0.001 | 0.002 | 1.700 | 0.001 | 0.001 | 0.001 | 0.001 | 1.600 | 0.001 |
| 4 | 2033 | 0.034 | 0.034 | 1.709 | 0.034 | 0.034 | 0.034 | 0.034 | 1.608 | 0.034 |
| 5 | 2546 | 0.034 | 0.034 | 1.709 | 0.034 | 0.034 | 0.034 | 0.034 | 1.608 | 0.034 |
| 6 | 3866 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| 9 | 6432 | 0.004 | 0.004 | 1.684 | 0.003 | 0.003 | 0.002 | 0.006 | 1.577 | 0.001 |
| 10 | 6805 | 0.001 | 0.002 | 1.700 | 0.001 | 0.002 | 0.002 | 0.001 | 1.600 | 0.001 |
| 11 | 8373 | 0.003 | 0.003 | 1.684 | 0.002 | 0.002 | 0.000 | 0.005 | 1.577 | 0.000 |
| 12 | 8418 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 1.700 | 0.000 | 0.000 | 0.000 | 0.000 | 1.600 | 0.000 |
| | Min | 0.000 | 0.000 | 1.684 | 0.000 | 0.000 | 0.000 | 0.000 | 1.577 | 0.000 |
| | Max | 0.034 | 0.034 | 1.709 | 0.034 | 0.034 | 0.034 | 0.034 | 1.608 | 0.034 |
| | Standard Deviation | 0.012 | 0.012 | 0.007 | 0.012 | 0.012 | 0.012 | 0.012 | 0.009 | 0.012 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.012 | 0.012 | 0.007 | 0.012 | 0.012 | 0.012 | 0.012 | 0.009 | 0.012 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 1,425 Hz | f = 1,475 Hz | f = 1,525 Hz | f = 1,575 Hz | f = 1,625 Hz | f = 1,675 Hz | f = 1,725 Hz | f = 1,775 Hz | f = 1,825 Hz |
| 1 | 0581 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 3 | 1136 | 0.001 | 0.001 | 0.001 | 1.050 | 0.001 | 0.006 | 0.001 | 0.001 | 0.001 |
| 4 | 2033 | 0.034 | 0.034 | 0.034 | 1.057 | 0.034 | 0.034 | 0.034 | 0.034 | 0.034 |
| 5 | 2546 | 0.034 | 0.034 | 0.034 | 1.057 | 0.034 | 0.034 | 0.034 | 0.034 | 0.034 |
| 6 | 3866 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 9 | 6432 | 0.004 | 0.001 | 0.013 | 1.028 | 0.009 | 0.006 | 0.001 | 0.017 | 0.001 |
| 10 | 6805 | 0.001 | 0.001 | 0.003 | 1.050 | 0.001 | 0.001 | 0.001 | 0.004 | 0.004 |
| 11 | 8373 | 0.002 | 0.000 | 0.004 | 1.029 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 |
| 12 | 8418 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 0.000 | 1.050 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | Min | 0.000 | 0.000 | 0.000 | 1.028 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | Max | 0.034 | 0.034 | 0.034 | 1.057 | 0.034 | 0.034 | 0.034 | 0.034 | 0.034 |
| | Standard Deviation | 0.012 | 0.012 | 0.012 | 0.009 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.012 | 0.012 | 0.012 | 0.009 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | |
|---|---|---|---|---|---|
| No. | ID | f = 1,875 Hz | f = 1,925 Hz | f = 1,975 Hz | Bin assignment OK |
| 1 | 0581 | 1.475 | 1.700 | 0.000 | Yes |
| 2 | 0857 | 1.475 | 1.700 | 0.000 | Yes |
| 3 | 1136 | 1.475 | 1.700 | 0.001 | Yes |
| 4 | 2033 | 1.481 | 1.706 | 0.034 | Yes |
| 5 | 2546 | 1.481 | 1.706 | 0.034 | Yes |
| 6 | 3866 | 1.475 | 1.700 | 0.000 | Yes |
| 7 | 4515 | 1.475 | 1.700 | 0.000 | Yes |
| 8 | 4803 | 1.475 | 1.700 | 0.000 | Yes |
| 9 | 6432 | 1.432 | 1.648 | 0.001 | Yes |
| 10 | 6805 | 1.475 | 1.700 | 0.004 | Yes |
| 11 | 8373 | 1.433 | 1.649 | 0.001 | Yes |
| 12 | 8418 | 1.475 | 1.700 | 0.000 | Yes |
| 13 | 8819 | 1.475 | 1.700 | 0.000 | Yes |
| Statistics (all participants) | Assigned value | 1.475 | 1.700 | 0.000 | -- |
| | Min | 1.432 | 1.648 | 0.000 | -- |
| | Max | 1.481 | 1.706 | 0.034 | -- |
| | Standard Deviation | 0.016 | 0.019 | 0.012 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.016 | 0.019 | 0.012 | -- |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | -- |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | -- |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 75 Hz | f = 125 Hz | f = 175 Hz | f = 225 Hz | f = 275 Hz | f = 325 Hz | f = 375 Hz | f = 425 Hz | f = 475 Hz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.08 | 0.33 | 0.00 | 0.41 | 0.08 | 0.33 | 0.00 | 0.08 |
| 4 | 2033 | 2.73 | 2.80 | 2.81 | 2.73 | 2.81 | 2.81 | 2.83 | 2.49 | 2.80 |
| 5 | 2546 | 2.73 | 2.80 | 2.81 | 2.73 | 2.81 | 2.81 | 2.83 | 2.49 | 2.80 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.16 | 0.08 | 0.20 | 0.17 | 0.25 | 0.25 | 0.75 | 0.33 |
| 10 | 6805 | 0.00 | 0.08 | 0.08 | 0.00 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.08 | 0.08 | 0.10 | 0.00 | 0.08 | 0.17 | 0.75 | 0.08 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

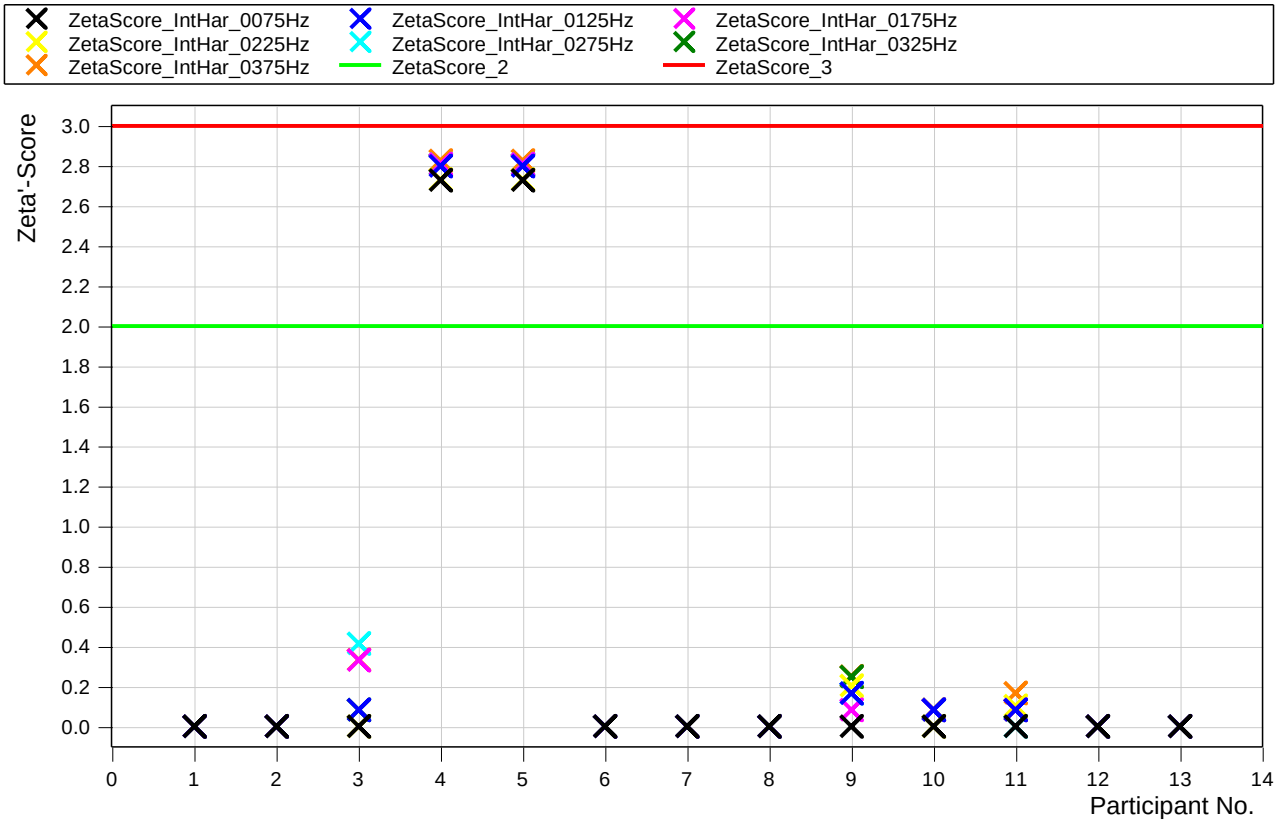
| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 525 Hz | f = 575 Hz | f = 625 Hz | f = 675 Hz | f = 725 Hz | f = 775 Hz | f = 825 Hz | f = 875 Hz | f = 925 Hz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.41 | 0.08 | 0.00 | 0.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 |
| 4 | 2033 | 2.80 | 2.82 | 2.79 | 2.39 | 2.81 | 2.79 | 2.83 | 2.79 | 1.69 |
| 5 | 2546 | 2.80 | 2.82 | 2.79 | 2.39 | 2.81 | 2.79 | 2.83 | 2.79 | 1.69 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.08 | 0.25 | 0.16 | 0.96 | 0.33 | 0.08 | 0.33 | 0.08 | 1.88 |
| 10 | 6805 | 0.08 | 0.08 | 0.00 | 0.00 | 0.08 | 0.16 | 0.25 | 0.08 | 0.00 |
| 11 | 8373 | 0.00 | 0.25 | 0.16 | 0.96 | 0.08 | 0.00 | 0.25 | 0.00 | 1.88 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

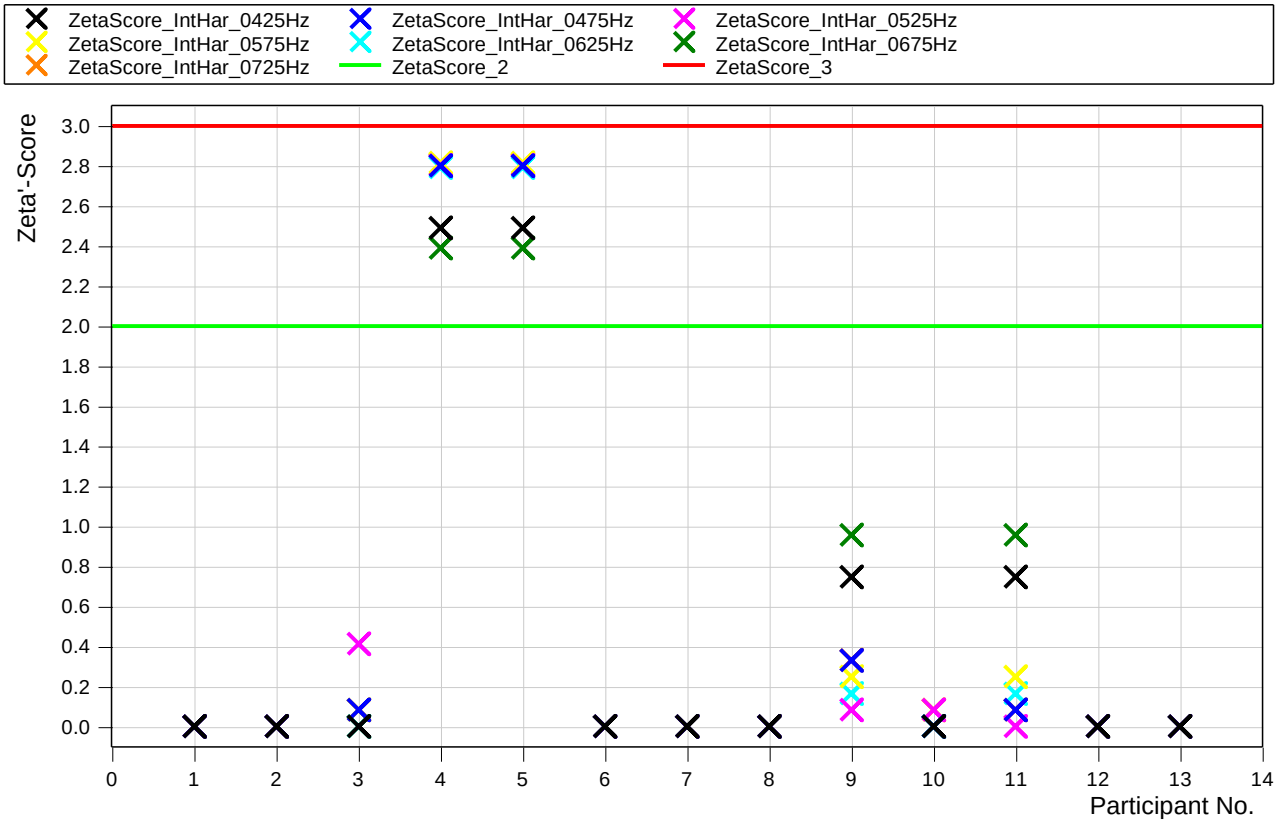
The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 975 Hz | f = 1,025 Hz | f = 1,075 Hz | f = 1,125 Hz | f = 1,175 Hz | f = 1,225 Hz | f = 1,275 Hz | f = 1,325 Hz | f = 1,375 Hz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.08 | 0.17 | 0.00 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.08 |
| 4 | 2033 | 2.82 | 2.83 | 1.26 | 2.81 | 2.82 | 2.80 | 2.83 | 0.86 | 2.79 |
| 5 | 2546 | 2.82 | 2.83 | 1.26 | 2.81 | 2.82 | 2.80 | 2.83 | 0.86 | 2.79 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.33 | 0.33 | 2.24 | 0.25 | 0.25 | 0.16 | 0.50 | 2.47 | 0.08 |
| 10 | 6805 | 0.08 | 0.17 | 0.00 | 0.08 | 0.17 | 0.16 | 0.08 | 0.00 | 0.08 |
| 11 | 8373 | 0.25 | 0.25 | 2.24 | 0.17 | 0.17 | 0.00 | 0.42 | 2.47 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 1,425 Hz | f = 1,475 Hz | f = 1,525 Hz | f = 1,575 Hz | f = 1,625 Hz | f = 1,675 Hz | f = 1,725 Hz | f = 1,775 Hz | f = 1,825 Hz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.08 | 0.08 | 0.08 | 0.00 | 0.08 | 0.50 | 0.08 | 0.08 | 0.08 |
| 4 | 2033 | 2.82 | 2.79 | 2.81 | 0.81 | 2.80 | 2.82 | 2.79 | 2.75 | 2.80 |
| 5 | 2546 | 2.82 | 2.79 | 2.81 | 0.81 | 2.80 | 2.82 | 2.79 | 2.75 | 2.80 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.33 | 0.08 | 1.07 | 2.55 | 0.74 | 0.50 | 0.08 | 1.37 | 0.08 |
| 10 | 6805 | 0.08 | 0.08 | 0.25 | 0.00 | 0.08 | 0.08 | 0.08 | 0.32 | 0.33 |
| 11 | 8373 | 0.17 | 0.00 | 0.33 | 2.44 | 0.08 | 0.00 | 0.00 | 0.08 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Interharmonic currents | | | | |
|---|---|---|---|---|---|---|
| No. | ID | f = 1,875 Hz | f = 1,925 Hz | f = 1,975 Hz | Bin assignment OK | Level of compliance (overall task 5.2) |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.00 | 0.00 | 0.08 | Yes | |
| 4 | 2033 | 0.38 | 0.31 | 2.81 | Yes | |
| 5 | 2546 | 0.38 | 0.31 | 2.81 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | Yes | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 2.71 | 2.72 | 0.08 | Yes | |
| 10 | 6805 | 0.00 | 0.00 | 0.33 | Yes | |
| 11 | 8373 | 2.64 | 2.67 | 0.08 | Yes | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | Yes | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | Yes | |

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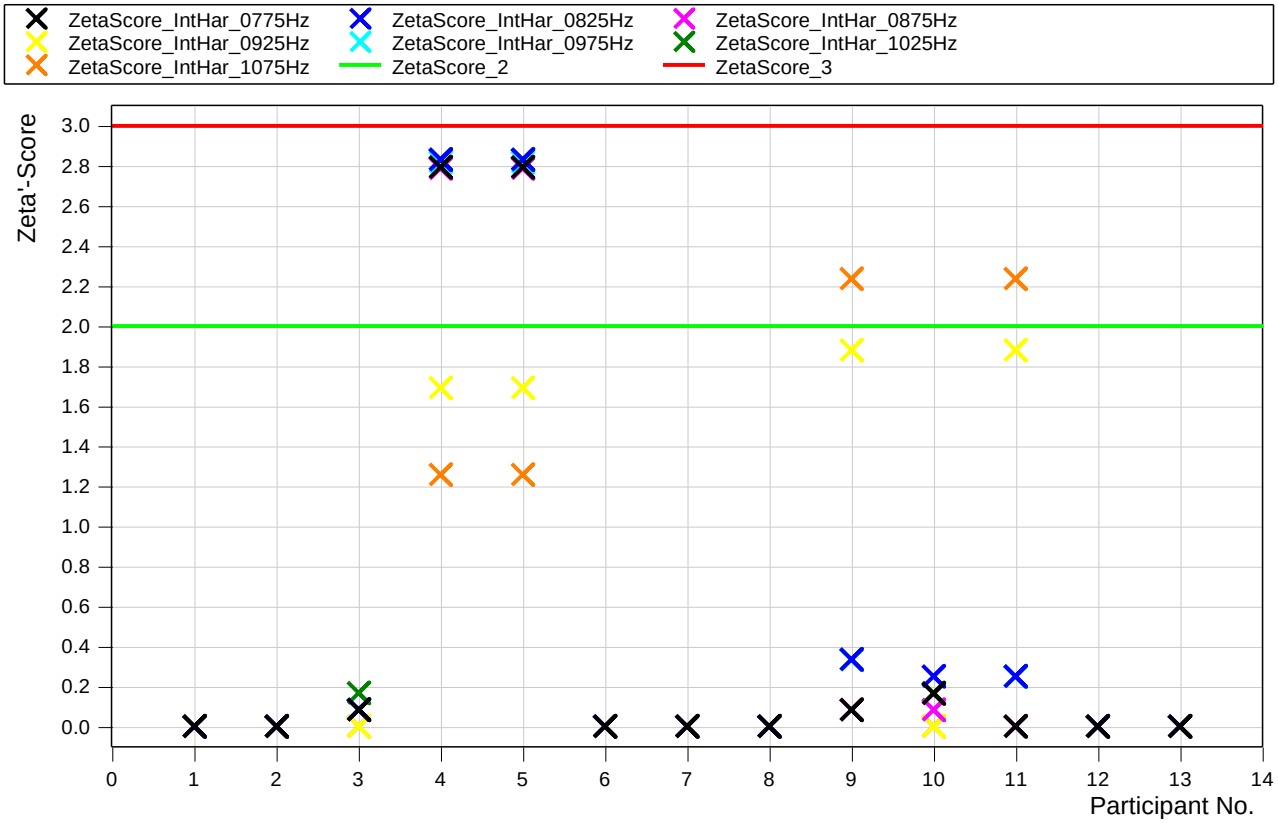
ZetaScore_IntHar_0475Hz
ZetaScore_IntHar_0525Hz
ZetaScore_IntHar_0575Hz
ZetaScore_IntHar_0625Hz
ZetaScore_IntHar_0675Hz
ZetaScore_IntHar_0725Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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ZetaScore_IntHar_0825Hz
ZetaScore_IntHar_0875Hz
ZetaScore_IntHar_0925Hz
ZetaScore_IntHar_0975Hz
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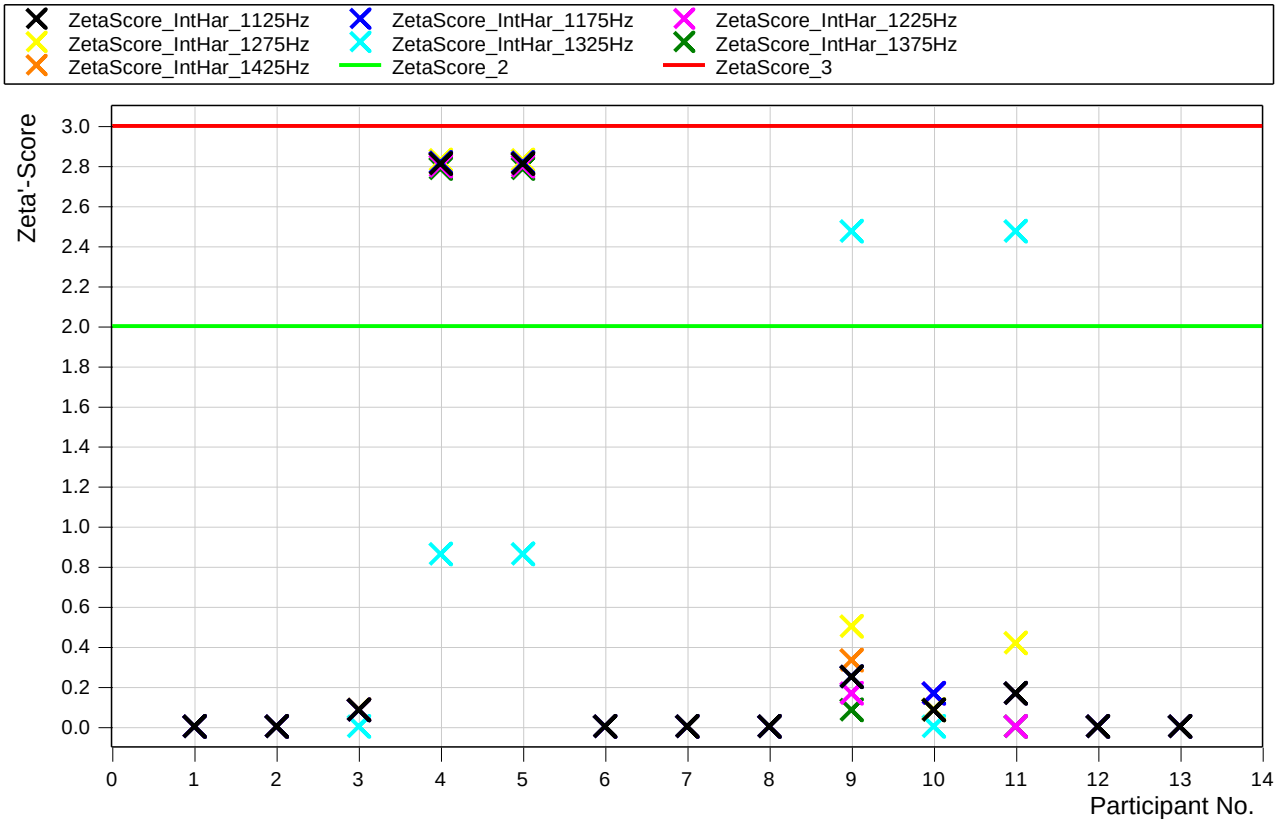
ZetaScore_IntHar_1075Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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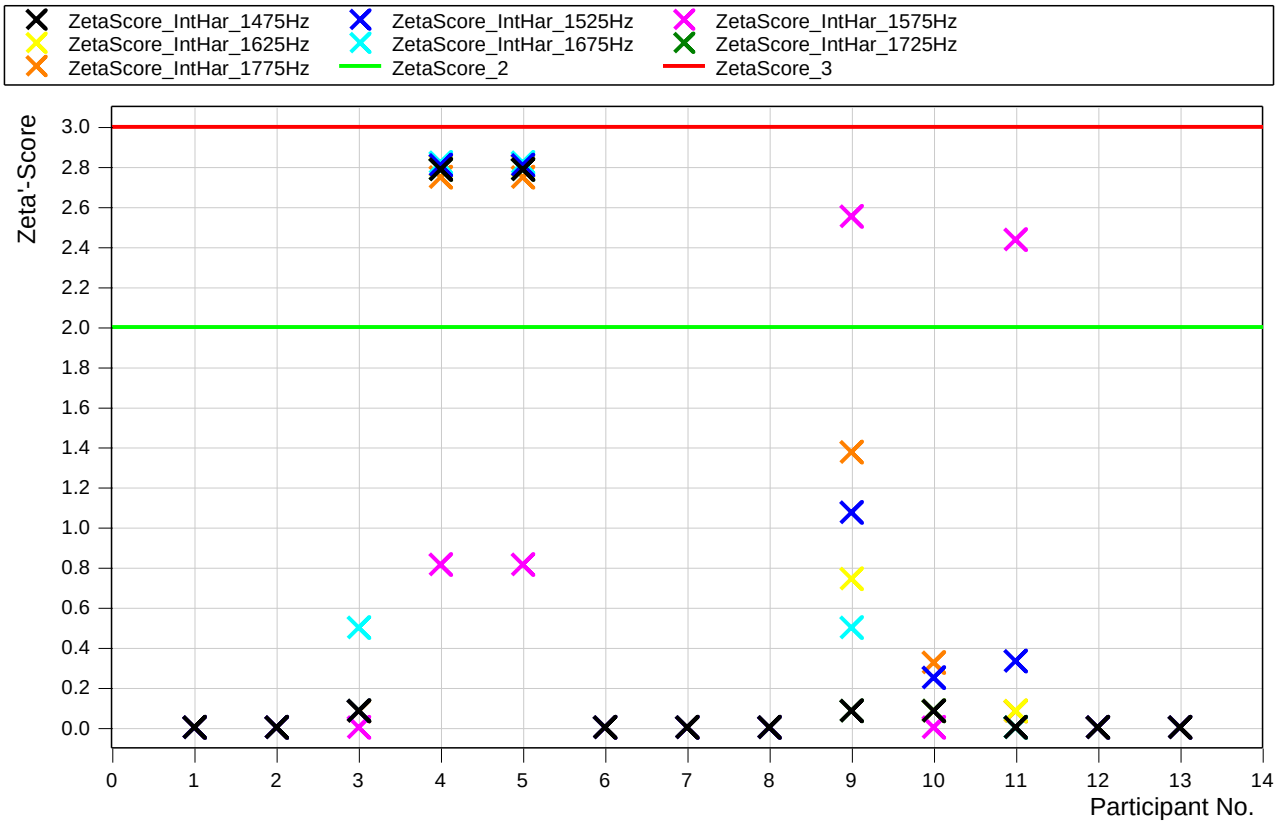
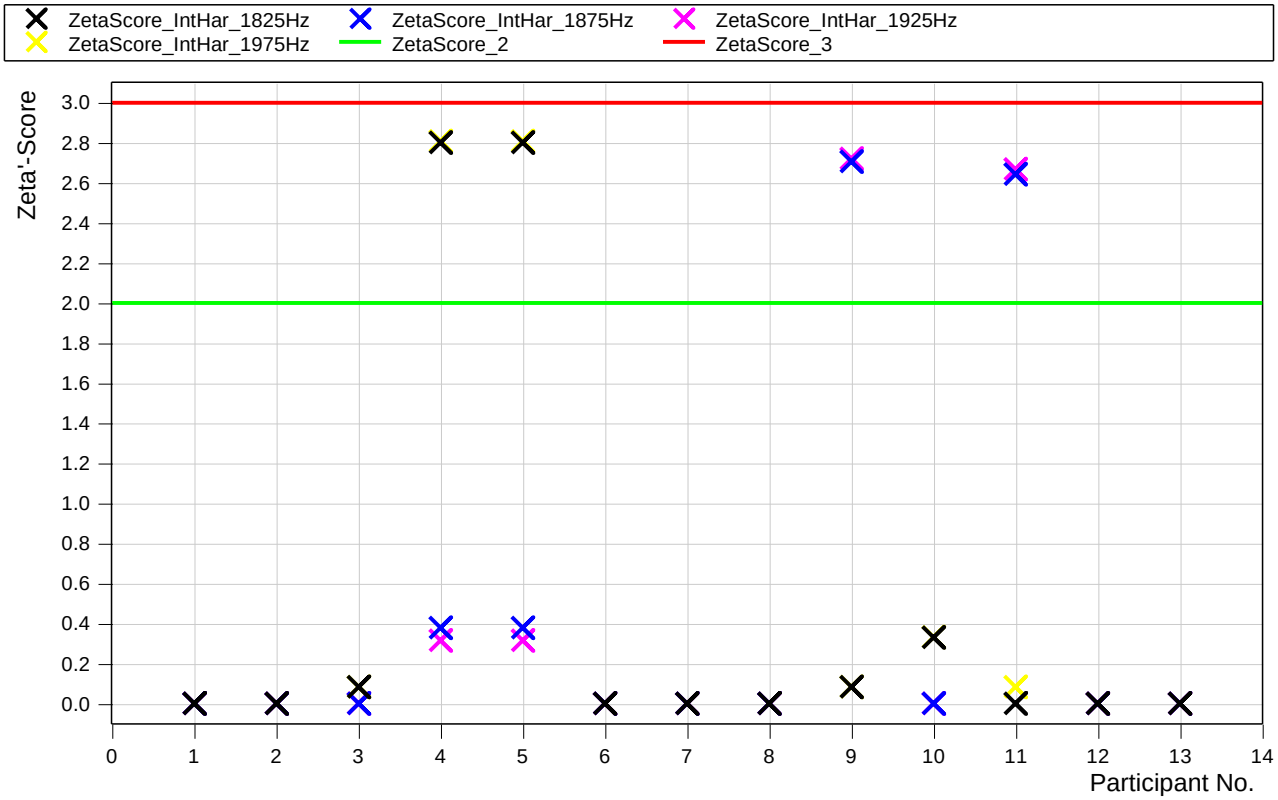
ZetaScore_IntHar_1175Hz
ZetaScore_IntHar_1225Hz
ZetaScore_IntHar_1275Hz
ZetaScore_IntHar_1325Hz
ZetaScore_IntHar_1375Hz
ZetaScore_IntHar_1425Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_IntHar_1475Hz
ZetaScore_IntHar_1525Hz
ZetaScore_IntHar_1575Hz
ZetaScore_IntHar_1625Hz
ZetaScore_IntHar_1675Hz
ZetaScore_IntHar_1725Hz
ZetaScore_IntHar_1775Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_IntHar_1825Hz
ZetaScore_IntHar_1875Hz
ZetaScore_IntHar_1925Hz
ZetaScore_IntHar_1975Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Participant No.

### Task 5.3 (Higher frequency components of current)

The following table shows the delivered results of the participants and the corresponding statistics. In this task, four participants are located in the red level. Two participants are located in the yellow level. Values with grey background are only informative and not considered for the evaluation of the level of compliance.

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 2.1 kHz | f = 2.3 kHz | f = 2.5 kHz | f = 2.7 kHz | f = 2.9 kHz | f = 3.1 kHz | f = 3.3 kHz | f = 3.5 kHz | f = 3.7 kHz |
| 1 | 0581 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| 2 | 0857 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| 3 | 1136 | 1.000 | 1.750 | 1.250 | 0.004 | 0.002 | 1.400 | 0.002 | 0.002 | 0.002 |
| 4 | 2033 | 1.127 | 1.787 | 1.285 | 0.243 | 0.218 | 1.418 | 0.184 | 0.171 | 0.161 |
| 5 | 2546 | 1.127 | 1.787 | 1.285 | 0.243 | 0.218 | 1.418 | 0.184 | 0.171 | 0.161 |
| 6 | 3866 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| 7 | 4515 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| 8 | 4803 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| 9 | 6432 | 0.964 | 1.678 | 1.188 | 0.036 | 0.027 | 1.293 | 0.015 | 0.045 | 0.007 |
| 10 | 6805 | 1.000 | 1.750 | 1.250 | 0.001 | 0.001 | 1.400 | 0.002 | 0.002 | 0.001 |
| 11 | 8373 | 0.964 | 1.678 | 1.187 | 0.004 | 0.007 | 1.293 | 0.014 | 0.006 | 0.003 |
| 12 | 8418 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| 13 | 8819 | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| Statistics (all participants) | Assigned value | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| | Min | 0.964 | 1.678 | 1.187 | 0.000 | 0.000 | 1.293 | 0.000 | 0.000 | 0.000 |
| | Max | 1.127 | 1.787 | 1.285 | 0.243 | 0.218 | 1.418 | 0.184 | 0.171 | 0.161 |
| | Standard Deviation | 0.050 | 0.031 | 0.028 | 0.087 | 0.078 | 0.040 | 0.065 | 0.061 | 0.058 |
| Statistics (successful participants) | Assigned value | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| | Min | 1.000 | 1.750 | 1.250 | 0.000 | 0.000 | 1.400 | 0.000 | 0.000 | 0.000 |
| | Max | 1.127 | 1.787 | 1.285 | 0.243 | 0.218 | 1.418 | 0.184 | 0.171 | 0.161 |
| | Standard Deviation | 0.053 | 0.015 | 0.015 | 0.101 | 0.091 | 0.007 | 0.076 | 0.071 | 0.067 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.050 | 0.031 | 0.028 | 0.087 | 0.078 | 0.040 | 0.065 | 0.061 | 0.058 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 3.9 kHz | f = 4.1 k Hz | f = 4.3 kHz | f = 4.5 kHz | f = 4.7 kHz | f = 4.9 kHz | f = 5.1 kHz | f = 5.3 kHz | f = 5.5 kHz |
| 1 | 0581 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| 2 | 0857 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| 3 | 1136 | 0.003 | 0.002 | 1.600 | 0.002 | 0.007 | 0.002 | 1.125 | 0.004 | 0.003 |
| 4 | 2033 | 0.152 | 0.145 | 1.609 | 0.133 | 0.130 | 0.128 | 1.133 | 0.127 | 0.126 |
| 5 | 2546 | 0.152 | 0.145 | 1.609 | 0.133 | 0.130 | 0.128 | 1.133 | 0.127 | 0.126 |
| 6 | 3866 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| 7 | 4515 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| 8 | 4803 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| 9 | 6432 | 0.043 | 0.016 | 1.371 | 0.009 | 0.109 | 0.007 | 0.904 | 0.022 | 0.108 |
| 10 | 6805 | 0.002 | 0.002 | 1.600 | 0.002 | 0.001 | 0.002 | 1.125 | 0.001 | 0.001 |
| 11 | 8373 | 0.002 | 0.015 | 1.371 | 0.007 | 0.001 | 0.003 | 0.904 | 0.021 | 0.020 |
| 12 | 8418 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| 13 | 8819 | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| | Min | 0.000 | 0.000 | 1.371 | 0.000 | 0.000 | 0.000 | 0.904 | 0.000 | 0.000 |
| | Max | 0.152 | 0.145 | 1.609 | 0.133 | 0.130 | 0.128 | 1.133 | 0.127 | 0.126 |
| | Standard Deviation | 0.054 | 0.051 | 0.083 | 0.047 | 0.052 | 0.046 | 0.080 | 0.045 | 0.050 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| | Min | 0.000 | 0.000 | 1.600 | 0.000 | 0.000 | 0.000 | 1.125 | 0.000 | 0.000 |
| | Max | 0.152 | 0.145 | 1.609 | 0.133 | 0.130 | 0.128 | 1.133 | 0.127 | 0.126 |
| | Standard Deviation | 0.063 | 0.060 | 0.004 | 0.055 | 0.054 | 0.053 | 0.003 | 0.053 | 0.052 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.054 | 0.051 | 0.083 | 0.047 | 0.052 | 0.046 | 0.080 | 0.045 | 0.050 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 5.7 kHz | f = 5.9 kHz | f = 6.1 kHz | f = 6.3 kHz | f = 6.5 kHz | f = 6.7 kHz | f = 6.9 kHz | f = 7.1 kHz | f = 7.3 kHz |
| 1 | 0581 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| 2 | 0857 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| 3 | 1136 | 0.002 | 0.002 | 0.007 | 0.004 | 1.350 | 0.004 | 0.005 | 0.004 | 1.988 |
| 4 | 2033 | 0.126 | 0.126 | 0.126 | 0.127 | 1.355 | 0.133 | 0.146 | 0.749 | 1.855 |
| 5 | 2546 | 0.126 | 0.126 | 0.126 | 0.127 | 1.355 | 0.133 | 0.146 | 0.749 | 1.855 |
| 6 | 3866 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| 7 | 4515 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 1.732 |
| 8 | 4803 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| 9 | 6432 | 0.011 | 0.014 | 0.061 | 0.027 | 0.942 | 0.046 | 0.233 | 0.005 | 1.263 |
| 10 | 6805 | 0.001 | 0.001 | 0.001 | 0.001 | 1.350 | 0.001 | 0.001 | 0.016 | 2.000 |
| 11 | 8373 | 0.000 | 0.004 | 0.019 | 0.026 | 0.943 | 0.009 | 0.001 | 0.005 | 1.089 |
| 12 | 8418 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| 13 | 8819 | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| | Min | 0.000 | 0.000 | 0.000 | 0.000 | 0.942 | 0.000 | 0.000 | 0.000 | 1.089 |
| | Max | 0.126 | 0.126 | 0.126 | 0.127 | 1.355 | 0.133 | 0.233 | 0.749 | 2.000 |
| | Standard Deviation | 0.045 | 0.045 | 0.046 | 0.045 | 0.147 | 0.048 | 0.076 | 0.269 | 0.292 |
| Statistics (successful participants) | Assigned value | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 2.000 |
| | Min | 0.000 | 0.000 | 0.000 | 0.000 | 1.350 | 0.000 | 0.000 | 0.000 | 1.855 |
| | Max | 0.126 | 0.126 | 0.126 | 0.127 | 1.355 | 0.133 | 0.146 | 0.749 | 2.000 |
| | Standard Deviation | 0.052 | 0.052 | 0.052 | 0.053 | 0.002 | 0.055 | 0.061 | 0.310 | 0.060 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.045 | 0.045 | 0.046 | 0.045 | 0.147 | 0.048 | 0.076 | 0.269 | 0.088 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 7.5 kHz | f = 7.7 kHz | f = 7.9 kHz | f = 8.1 kHz | f = 8.3 kHz | f = 8.5 kHz | f = 8.7 kHz | f = 8.9 kHz | Bin assign-ment OK |
| 1 | 0581 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| 2 | 0857 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| 3 | 1136 | 0.004 | 0.009 | 0.008 | 0.003 | 0.004 | 0.002 | 1.432 | 0.003 | Yes |
| 4 | 2033 | 0.105 | 0.107 | 0.108 | 0.109 | 0.110 | 0.111 | 1.649 | 0.111 | Yes |
| 5 | 2546 | 0.105 | 0.107 | 0.108 | 0.109 | 0.110 | 0.111 | 1.649 | 0.111 | Yes |
| 6 | 3866 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| 7 | 4515 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| 8 | 4803 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| 9 | 6432 | 0.037 | 0.359 | 0.216 | 0.031 | 0.096 | 0.010 | 0.848 | 0.015 | Yes |
| 10 | 6805 | 0.017 | 0.002 | 0.001 | 0.001 | 0.001 | 0.002 | 1.650 | 0.001 | Yes |
| 11 | 8373 | 0.037 | 0.028 | 0.002 | 0.031 | 0.055 | 0.011 | 0.848 | 0.002 | Yes |
| 12 | 8418 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| 13 | 8819 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | Yes |
| Statistics (all participants) | Assigned value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | -- |
| | Min | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.848 | 0.000 | -- |
| | Max | 0.105 | 0.359 | 0.216 | 0.109 | 0.110 | 0.111 | 1.650 | 0.111 | -- |
| | Standard Deviation | 0.037 | 0.098 | 0.065 | 0.039 | 0.044 | 0.039 | 0.288 | 0.040 | -- |
| Statistics (successful participants) | Assigned value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.650 | 0.000 | -- |
| | Min | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.649 | 0.000 | -- |
| | Max | 0.105 | 0.107 | 0.108 | 0.109 | 0.110 | 0.111 | 1.650 | 0.111 | -- |
| | Standard Deviation | 0.043 | 0.044 | 0.045 | 0.045 | 0.046 | 0.046 | 0.000 | 0.046 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.037 | 0.098 | 0.065 | 0.039 | 0.044 | 0.039 | 0.063 | 0.040 | -- |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | 0.0007 | -- |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -- |

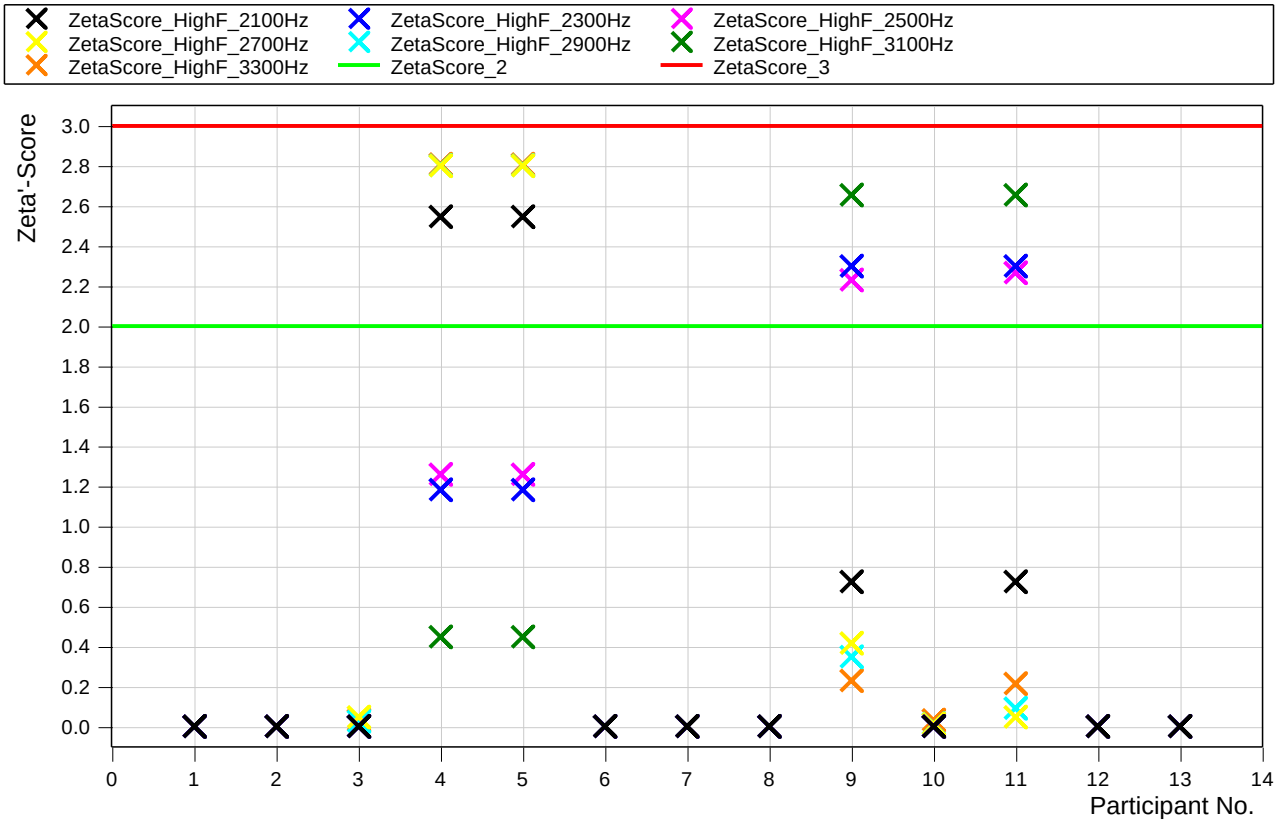
The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 2.1 kHz | f = 2.3 kHz | f = 2.5 kHz | f = 2.7 kHz | f = 2.9 kHz | f = 3.1 kHz | f = 3.3 kHz | f = 3.5 kHz | f = 3.7 kHz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.05 | 0.03 | 0.00 | 0.03 | 0.03 | 0.03 |
| 4 | 2033 | 2.55 | 1.18 | 1.26 | 2.80 | 2.80 | 0.45 | 2.81 | 2.80 | 2.79 |
| 5 | 2546 | 2.55 | 1.18 | 1.26 | 2.80 | 2.80 | 0.45 | 2.81 | 2.80 | 2.79 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.72 | 2.30 | 2.23 | 0.42 | 0.35 | 2.65 | 0.23 | 0.74 | 0.12 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.03 | 0.03 | 0.02 |
| 11 | 8373 | 0.72 | 2.30 | 2.27 | 0.05 | 0.09 | 2.65 | 0.21 | 0.10 | 0.05 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 3.9 kHz | f = 4.1 k Hz | f = 4.3 kHz | f = 4.5 kHz | f = 4.7 kHz | f = 4.9 kHz | f = 5.1 kHz | f = 5.3 kHz | f = 5.5 kHz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.06 | 0.04 | 0.00 | 0.04 | 0.14 | 0.04 | 0.00 | 0.09 | 0.06 |
| 4 | 2033 | 2.80 | 2.82 | 0.11 | 2.80 | 2.51 | 2.80 | 0.10 | 2.83 | 2.52 |
| 5 | 2546 | 2.80 | 2.82 | 0.11 | 2.80 | 2.51 | 2.80 | 0.10 | 2.83 | 2.52 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.79 | 0.31 | 2.75 | 0.19 | 2.11 | 0.15 | 2.75 | 0.49 | 2.16 |
| 10 | 6805 | 0.04 | 0.04 | 0.00 | 0.04 | 0.02 | 0.04 | 0.00 | 0.02 | 0.02 |
| 11 | 8373 | 0.04 | 0.29 | 2.75 | 0.15 | 0.02 | 0.07 | 2.75 | 0.47 | 0.40 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 5.7 kHz | f = 5.9 kHz | f = 6.1 kHz | f = 6.3 kHz | f = 6.5 kHz | f = 6.7 kHz | f = 6.9 kHz | f = 7.1 kHz | f = 7.3 kHz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.04 | 0.04 | 0.15 | 0.09 | 0.00 | 0.08 | 0.07 | 0.01 | 0.14 |
| 4 | 2033 | 2.79 | 2.80 | 2.76 | 2.83 | 0.03 | 2.80 | 1.92 | 2.78 | 1.65 |
| 5 | 2546 | 2.79 | 2.80 | 2.76 | 2.83 | 0.03 | 2.80 | 1.92 | 2.78 | 1.65 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.06 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.24 | 0.31 | 1.34 | 0.60 | 2.77 | 0.97 | 3.06 | 0.02 | 8.41 |
| 10 | 6805 | 0.02 | 0.02 | 0.02 | 0.02 | 0.00 | 0.02 | 0.01 | 0.06 | 0.00 |
| 11 | 8373 | 0.00 | 0.09 | 0.42 | 0.58 | 2.76 | 0.19 | 0.01 | 0.02 | 10.39 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 7.5 kHz | f = 7.7 kHz | f = 7.9 kHz | f = 8.1 kHz | f = 8.3 kHz | f = 8.5 kHz | f = 8.7 kHz | f = 8.9 kHz | Bin assignment OK | Level of compliance (overall task 5.3) |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.11 | 0.09 | 0.12 | 0.08 | 0.09 | 0.05 | 3.48 | 0.08 | Yes | |
| 4 | 2033 | 2.83 | 1.10 | 1.66 | 2.81 | 2.48 | 2.82 | 0.02 | 2.81 | Yes | |
| 5 | 2546 | 2.83 | 1.10 | 1.66 | 2.81 | 2.48 | 2.82 | 0.02 | 2.81 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 1.00 | 3.68 | 3.32 | 0.80 | 2.16 | 0.25 | 12.81 | 0.38 | Yes | |
| 10 | 6805 | 0.46 | 0.02 | 0.02 | 0.03 | 0.02 | 0.05 | 0.00 | 0.03 | Yes | |
| 11 | 8373 | 1.00 | 0.29 | 0.03 | 0.80 | 1.24 | 0.28 | 12.81 | 0.05 | Yes | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |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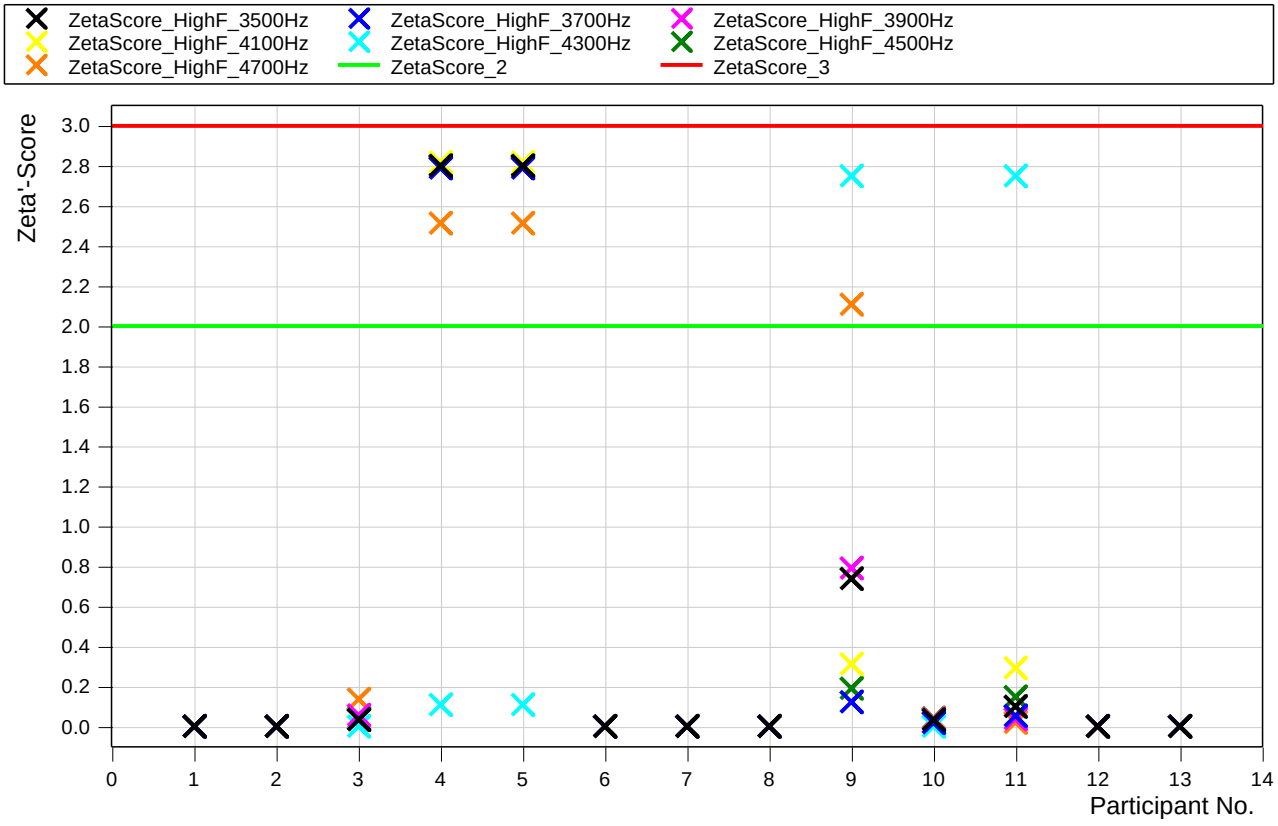
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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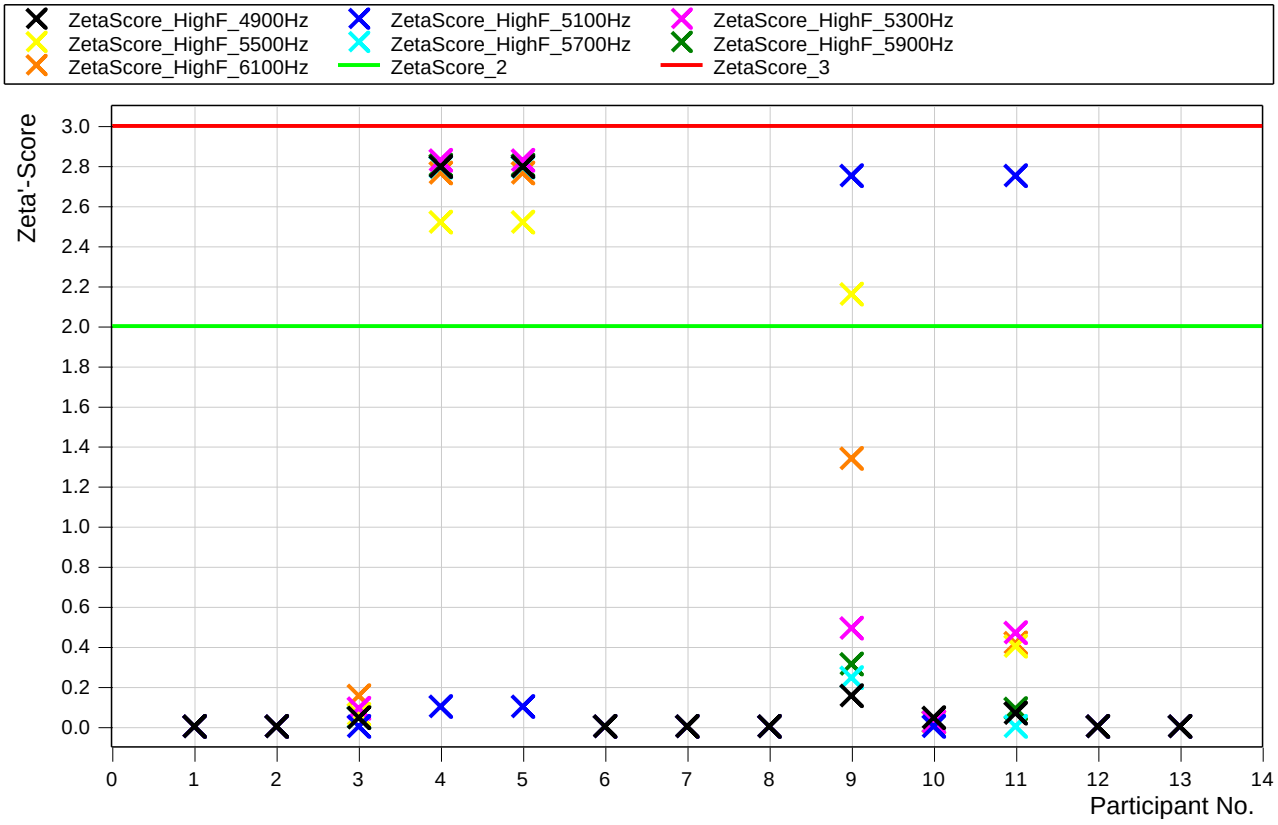
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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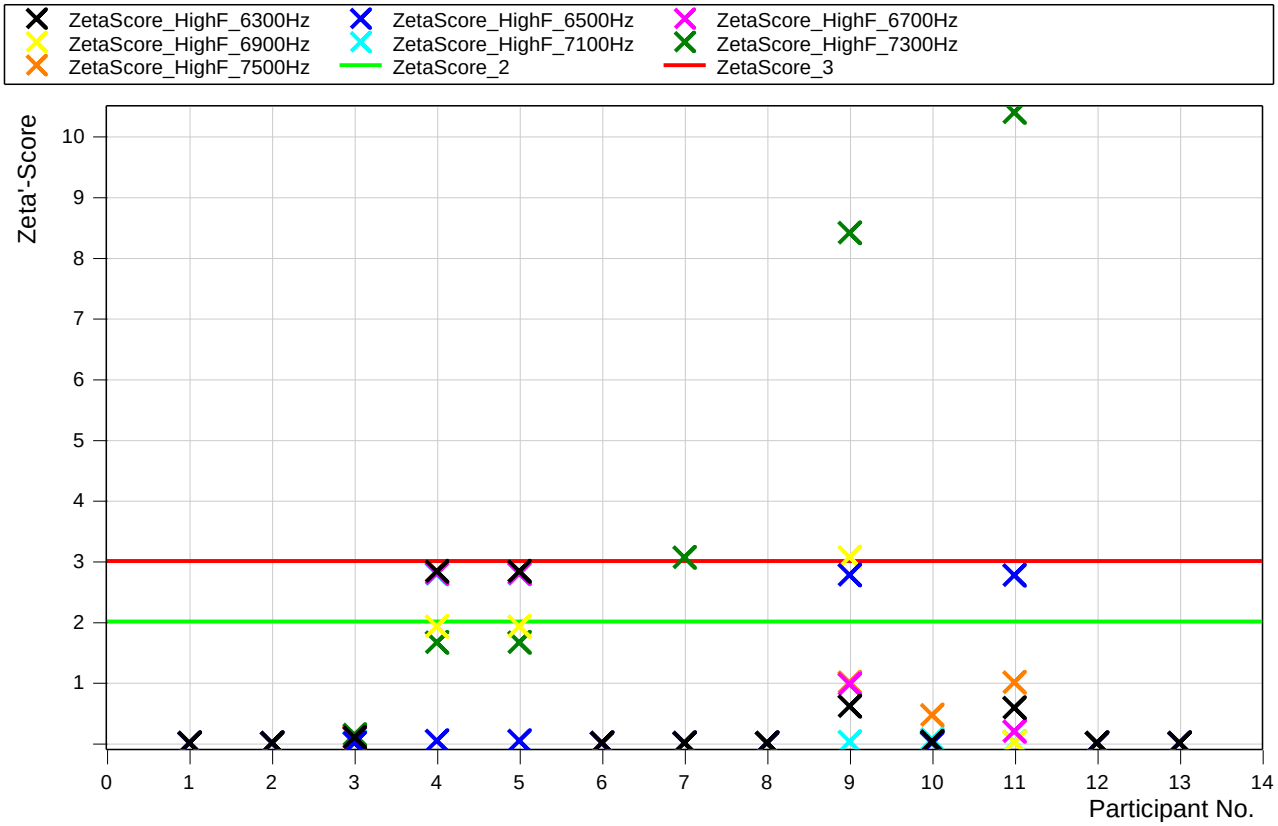
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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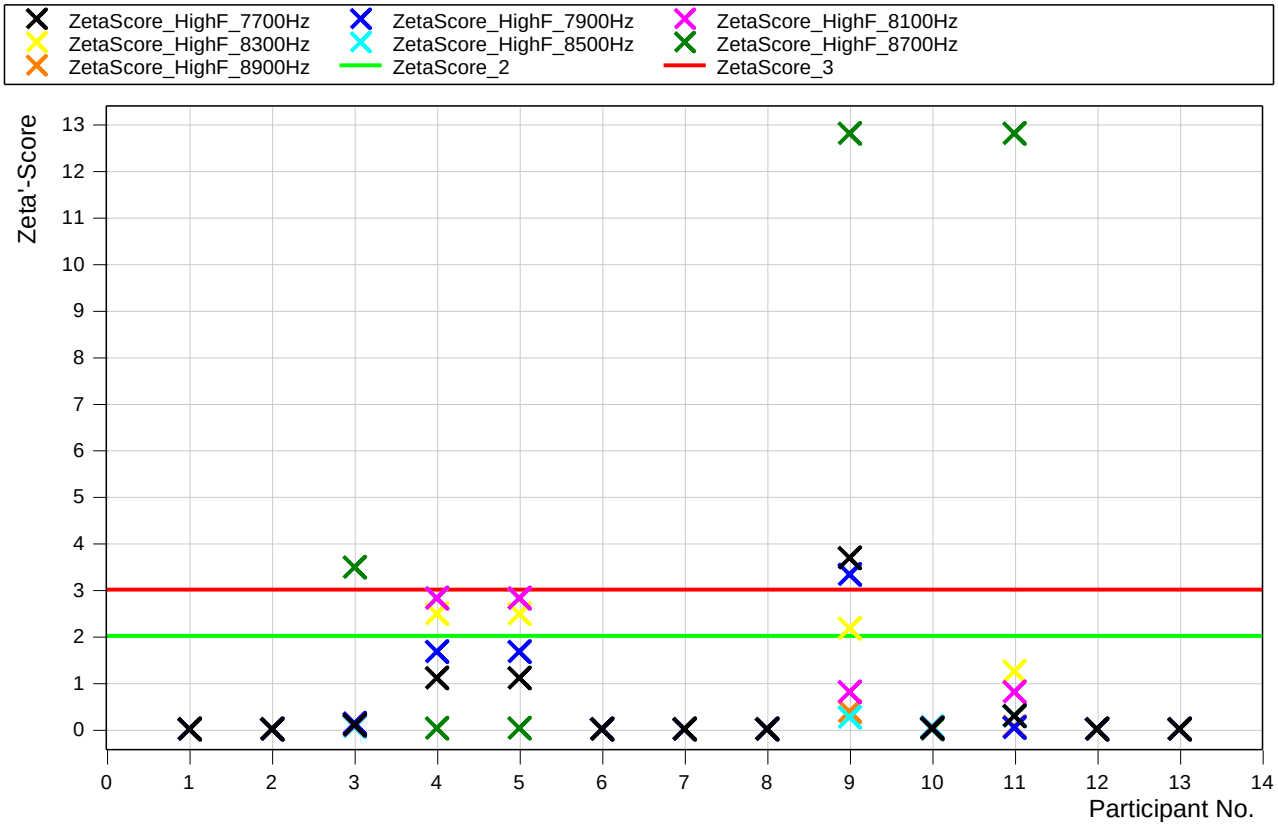
ZetaScore_HighF_7500Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_HighF_7700Hz
ZetaScore_HighF_7900Hz
ZetaScore_HighF_8100Hz
ZetaScore_HighF_8300Hz
ZetaScore_HighF_8500Hz
ZetaScore_HighF_8700Hz
ZetaScore_HighF_8900Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Participant No.

## 6.6. Task 6 – Harmonics, interharmonics, higher frequency components (real data)

Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3. According to [2], harmonic currents below 0.1% of $I_n$ for any of the harmonic orders do not need to be reported. They are typically below the measurement accuracy and may be considered as measurement noise (Chapter 8.2.4.3 [2]). The values were evaluated as follows:

- if the median is ≥0.1% of $I_n$ the participants' result will be considered in the level of compliance.
- if the median is <0.1% of $I_n$ the participants' result will be considered informative. This values are shown in grey background.

**Task 6.1 (Harmonics)**

The following table shows the delivered results of the participants and the corresponding statistics. In this task, one participant is located in the red level. No participant is located in the yellow level. Values with grey background are only informative and not considered for the evaluation of the level of compliance.

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 2 | h = 3 | h = 4 | h = 5 | h = 6 | h = 7 | h = 8 | h = 9 | h = 10 |
| 1 | 0581 | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.10 | 0.10 | 0.05 |
| 2 | 0857 | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 3 | 1136 | 0.08 | 0.92 | 0.09 | 0.15 | 0.08 | 2.45 | 0.08 | 0.06 | 0.04 |
| 4 | 2033 | 0.09 | 1.00 | 0.09 | 0.21 | 0.09 | 2.54 | 0.09 | 0.10 | 0.05 |
| 5 | 2546 | 0.09 | 1.00 | 0.09 | 0.21 | 0.09 | 2.54 | 0.09 | 0.10 | 0.05 |
| 6 | 3866 | 0.09 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 7 | 4515 | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 8 | 4803 | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 9 | 6432 | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 10 | 6805 | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 11 | 8373 | 0.09 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 12 | 8418 | 0.09 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| 13 | 8819 | 0.10 | 1.01 | 0.09 | 0.22 | 0.09 | 2.54 | 0.09 | 0.09 | 0.05 |
| Statistics (all participants) | Median | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| | Min | 0.08 | 0.92 | 0.09 | 0.15 | 0.08 | 2.45 | 0.08 | 0.06 | 0.04 |
| | Max | 0.10 | 1.01 | 0.09 | 0.22 | 0.10 | 2.54 | 0.10 | 0.10 | 0.05 |
| | Standard Deviation | 0.006 | 0.022 | 0.000 | 0.016 | 0.006 | 0.024 | 0.004 | 0.011 | 0.003 |
| Statistics (successful participants) | Median | 0.10 | 1.00 | 0.09 | 0.21 | 0.10 | 2.54 | 0.09 | 0.10 | 0.05 |
| | Min | 0.09 | 1.00 | 0.09 | 0.21 | 0.09 | 2.54 | 0.09 | 0.09 | 0.05 |
| | Max | 0.10 | 1.01 | 0.09 | 0.22 | 0.10 | 2.54 | 0.10 | 0.10 | 0.05 |
| | Standard Deviation | 0.005 | 0.003 | 0.000 | 0.003 | 0.004 | 0.000 | 0.003 | 0.003 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.006 | 0.022 | 0.000 | 0.016 | 0.006 | 0.024 | 0.004 | 0.011 | 0.003 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 11 | h = 12 | h = 13 | h = 14 | h = 15 | h = 16 | h = 17 | h = 18 | h = 19 |
| 1 | 0581 | 0.21 | 0.03 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 2 | 0857 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 3 | 1136 | 0.19 | 0.02 | 0.11 | 0.02 | 0.04 | 0.01 | 0.02 | 0.01 | 0.04 |
| 4 | 2033 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 5 | 2546 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 6 | 3866 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 7 | 4515 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 8 | 4803 | 0.21 | 0.03 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 9 | 6432 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 10 | 6805 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 11 | 8373 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 12 | 8418 | 0.21 | 0.03 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| 13 | 8819 | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| Statistics (all participants) | Median | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| | Min | 0.19 | 0.02 | 0.11 | 0.02 | 0.04 | 0.01 | 0.02 | 0.01 | 0.04 |
| | Max | 0.21 | 0.03 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| | Standard Deviation | 0.005 | 0.004 | 0.003 | 0.003 | 0.000 | 0.000 | 0.003 | 0.000 | 0.003 |
| Statistics (successful participants) | Median | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| | Min | 0.21 | 0.02 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| | Max | 0.21 | 0.03 | 0.12 | 0.03 | 0.04 | 0.01 | 0.03 | 0.01 | 0.05 |
| | Standard Deviation | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.005 | 0.004 | 0.003 | 0.003 | 0.000 | 0.000 | 0.003 | 0.000 | 0.003 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 20 | h = 21 | h = 22 | h = 23 | h = 24 | h = 25 | h = 26 | h = 27 | h = 28 |
| 1 | 0581 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 2 | 0857 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 3 | 1136 | 0.01 | 0.02 | 0.01 | 0.11 | 0.01 | 0.10 | 0.01 | 0.02 | 0.01 |
| 4 | 2033 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 5 | 2546 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 6 | 3866 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 7 | 4515 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 8 | 4803 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 9 | 6432 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 10 | 6805 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 11 | 8373 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 12 | 8418 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| 13 | 8819 | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| Statistics (all participants) | Median | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| | Min | 0.01 | 0.02 | 0.01 | 0.11 | 0.01 | 0.10 | 0.01 | 0.02 | 0.01 |
| | Max | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| | Standard Deviation | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 |
| Statistics (successful participants) | Median | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| | Min | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| | Max | 0.01 | 0.03 | 0.01 | 0.11 | 0.01 | 0.12 | 0.01 | 0.02 | 0.01 |
| | Standard Deviation | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 29 | h = 30 | h = 31 | h = 32 | h = 33 | h = 34 | h = 35 | h = 36 | h = 37 |
| 1 | 0581 | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 |
| 2 | 0857 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 3 | 1136 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 4 | 2033 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 5 | 2546 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| 6 | 3866 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 7 | 4515 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 8 | 4803 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| 9 | 6432 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 10 | 6805 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 11 | 8373 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 12 | 8418 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 13 | 8819 | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| Statistics (all participants) | Median | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| | Min | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| | Max | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 |
| | Standard Deviation | 0.003 | 0.003 | 0.000 | 0.000 | 0.004 | 0.000 | 0.004 | 0.000 | 0.000 |
| Statistics (successful participants) | Median | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| | Min | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| | Max | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 |
| | Standard Deviation | 0.000 | 0.003 | 0.000 | 0.000 | 0.004 | 0.000 | 0.004 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.003 | 0.003 | 0.000 | 0.000 | 0.004 | 0.000 | 0.004 | 0.000 | 0.000 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 38 | h = 39 | h = 40 | h = 41 | h = 42 | h = 43 | h = 44 | h = 45 | h = 46 |
| 1 | 0581 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| Statistics (all participants) | Median | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| | Min | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| | Standard Deviation | 0.000 | 0.003 | 0.000 | 0.005 | 0.003 | 0.000 | 0.003 | 0.000 | 0.000 |
| Statistics (successful participants) | Median | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| | Min | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| | Max | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 |
| | Median | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.003 | 0.000 | 0.005 | 0.003 | 0.000 | 0.003 | 0.000 | 0.000 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Harmonic currents ($I_h$ / $I_n$ [%]) | | | | |
|---|---|---|---|---|---|---|
| No. | ID | h = 47 | h = 48 | h = 49 | h = 50 | Bin assignment OK |
| 1 | 0581 | 0.00 | 0.07 | 0.00 | 0.23 | Yes |
| 2 | 0857 | 0.00 | 0.07 | 0.00 | 0.23 | Yes |
| 3 | 1136 | 0.00 | 0.04 | 0.00 | 0.22 | Yes |
| 4 | 2033 | 0.00 | 0.07 | 0.01 | 0.22 | Yes |
| 5 | 2546 | 0.00 | 0.07 | 0.01 | 0.23 | Yes |
| 6 | 3866 | 0.00 | 0.07 | 0.01 | 0.23 | Yes |
| 7 | 4515 | 0.00 | 0.07 | 0.00 | 0.23 | Yes |
| 8 | 4803 | 0.00 | 0.07 | 0.01 | 0.23 | Yes |
| 9 | 6432 | 0.00 | 0.07 | 0.01 | 0.21 | Yes |
| 10 | 6805 | 0.00 | 0.07 | 0.01 | 0.23 | Yes |
| 11 | 8373 | 0.00 | 0.07 | 0.01 | 0.21 | Yes |
| 12 | 8418 | 0.00 | 0.07 | 0.01 | 0.21 | Yes |
| 13 | 8819 | 0.00 | 0.07 | 0.01 | 0.22 | Yes |
| Statistics (all participants) | Median | 0.00 | 0.07 | 0.01 | 0.23 | -- |
| | Min | 0.00 | 0.04 | 0.00 | 0.21 | -- |
| | Max | 0.00 | 0.07 | 0.01 | 0.23 | -- |
| | Standard Deviation | 0.000 | 0.008 | 0.005 | 0.008 | -- |
| Statistics (successful participants) | Median | 0.00 | 0.07 | 0.01 | 0.23 | |
| | Min | 0.00 | 0.07 | 0.00 | 0.21 | |
| | Max | 0.00 | 0.07 | 0.01 | 0.23 | |
| | Standard Deviation | 0.000 | 0.000 | 0.004 | 0.008 | |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.008 | 0.005 | 0.008 | -- |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | -- |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | -- |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 2 | h = 3 | h = 4 | h = 5 | h = 6 | h = 7 | h = 8 | h = 9 | h = 10 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.24 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 2.11 | 3.50 | 0.00 | 3.36 | 2.12 | 3.60 | 1.24 | 3.10 | 1.32 |
| 4 | 2033 | 1.05 | 0.00 | 0.00 | 0.00 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 1.05 | 0.00 | 0.00 | 0.00 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.44 | 0.00 | 0.56 | 1.06 | 0.00 | 0.00 | 0.78 | 0.00 |

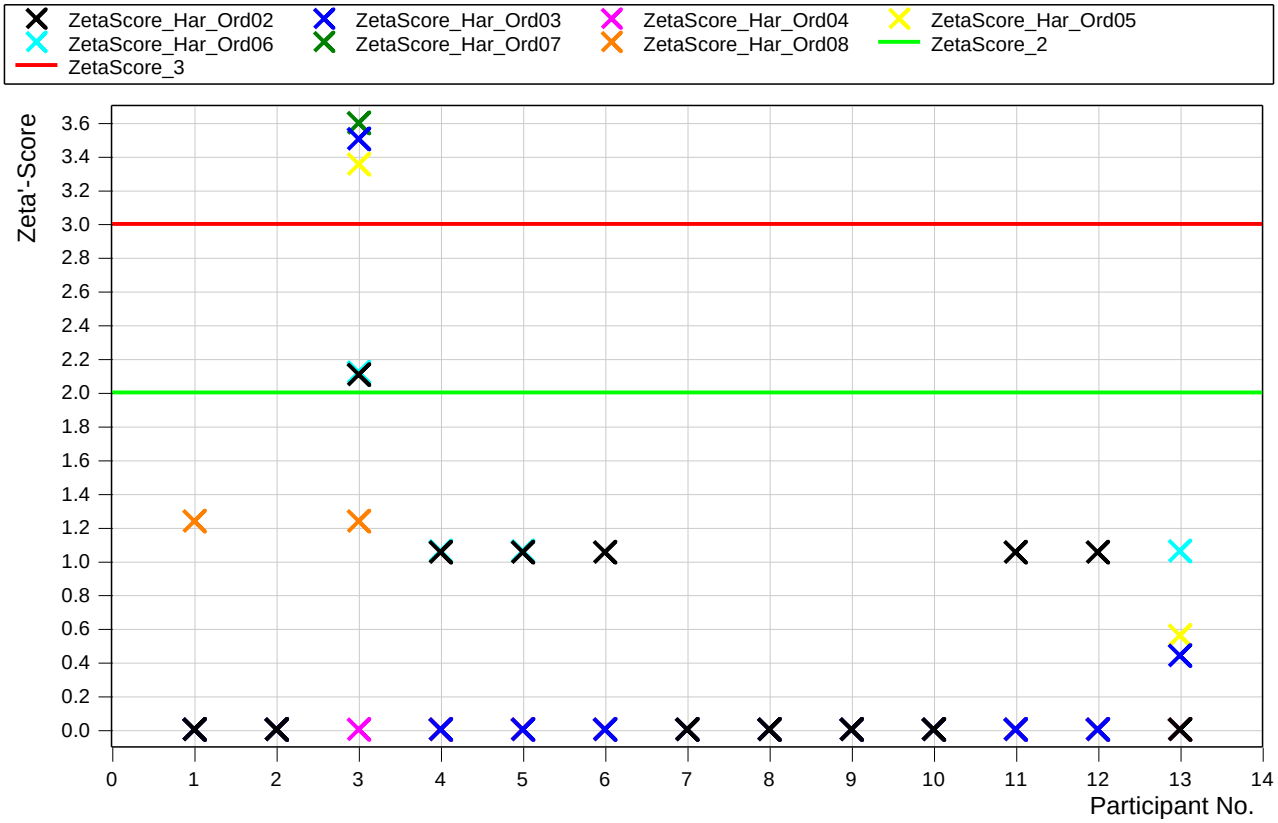
| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 11 | h = 12 | h = 13 | h = 14 | h = 15 | h = 16 | h = 17 | h = 18 | h = 19 |
| 1 | 0581 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 2.26 | 0.00 | 1.32 | 1.32 | 0.00 | 0.00 | 1.32 | 0.00 | 1.32 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 20 | h = 21 | h = 22 | h = 23 | h = 24 | h = 25 | h = 26 | h = 27 | h = 28 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 1.32 | 0.00 | 0.00 | 0.00 | 2.26 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 29 | h = 30 | h = 31 | h = 32 | h = 33 | h = 34 | h = 35 | h = 36 | h = 37 |
| 1 | 0581 | 0.00 | 1.32 | 0.00 | 0.00 | 1.26 | 0.00 | 1.21 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.21 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.21 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | h = 38 | h = 39 | h = 40 | h = 41 | h = 42 | h = 43 | h = 44 | h = 45 | h = 46 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 1.32 | 0.00 | 1.16 | 1.32 | 0.00 | 1.32 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Harmonic currents | | | | | |
|---|---|---|---|---|---|---|---|
| No. | ID | h = 47 | h = 48 | h = 49 | h = 50 | Bin assignment OK | Level of compliance (overall task 6.1) |
| 1 | 0581 | 0.00 | 0.00 | 1.18 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 1.18 | 0.00 | Yes | |
| 3 | 1136 | 0.00 | 2.81 | 1.18 | 0.92 | Yes | |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.92 | Yes | |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.00 | 0.00 | 1.18 | 0.00 | Yes | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 1.85 | Yes | |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 1.85 | Yes | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 1.85 | Yes | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.92 | Yes | |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ZetaScore_Har_Ord03
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ZetaScore_Har_Ord05
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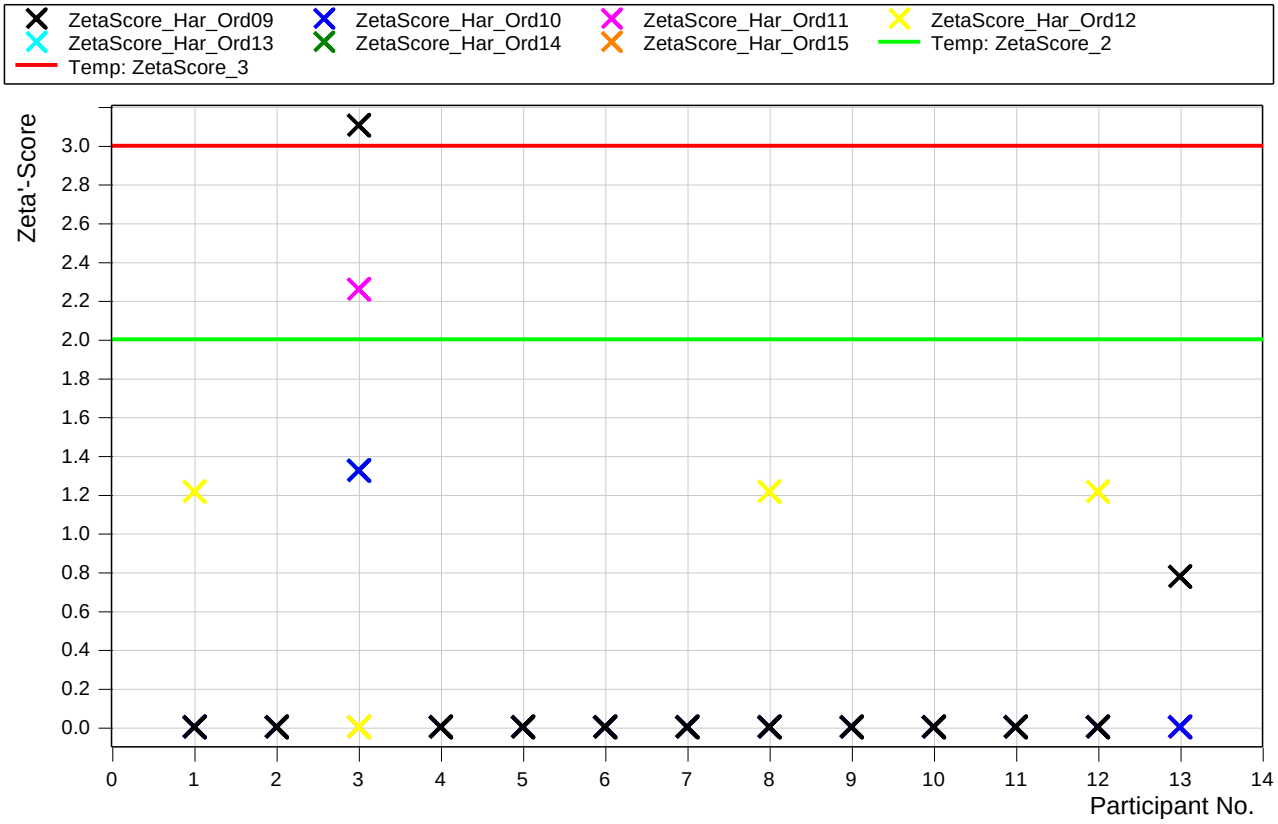
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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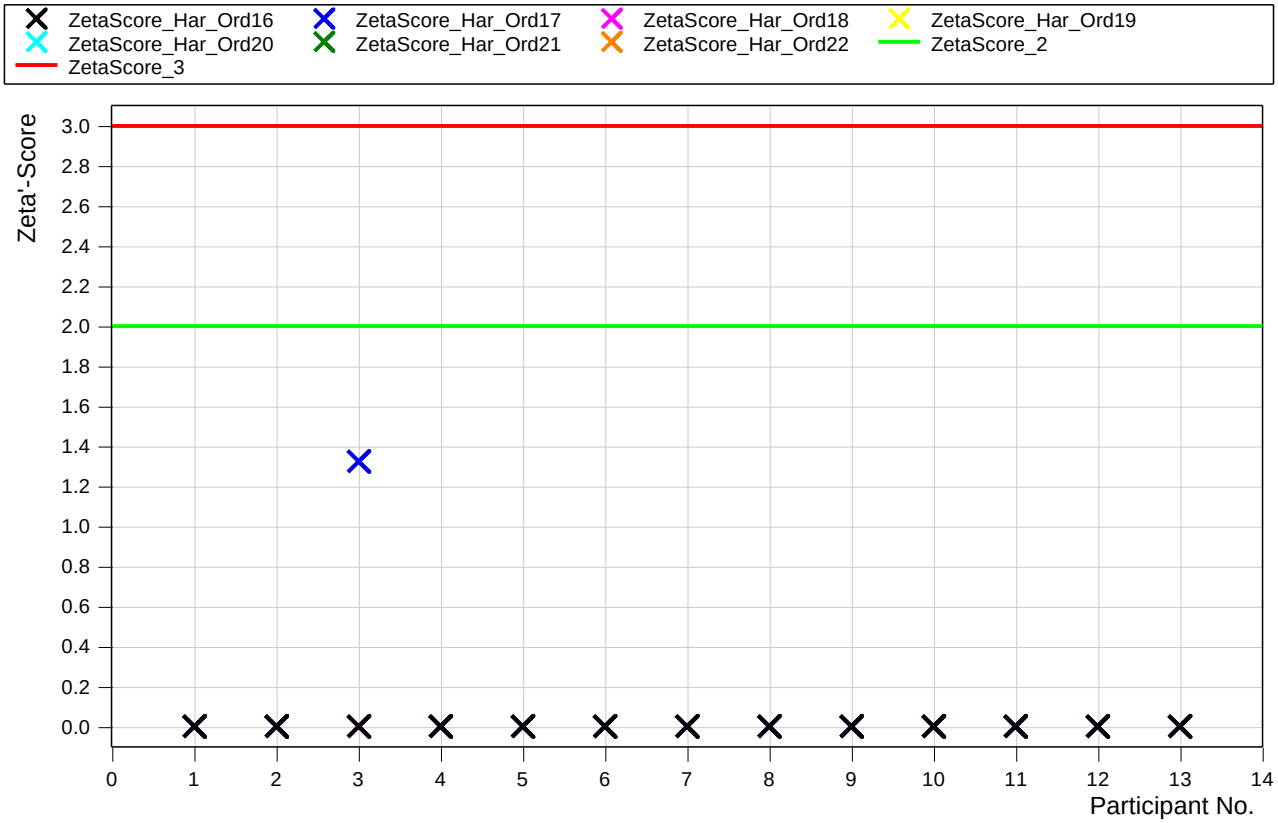
Temp: ZetaScore_3
Zeta'-Score
Participant No.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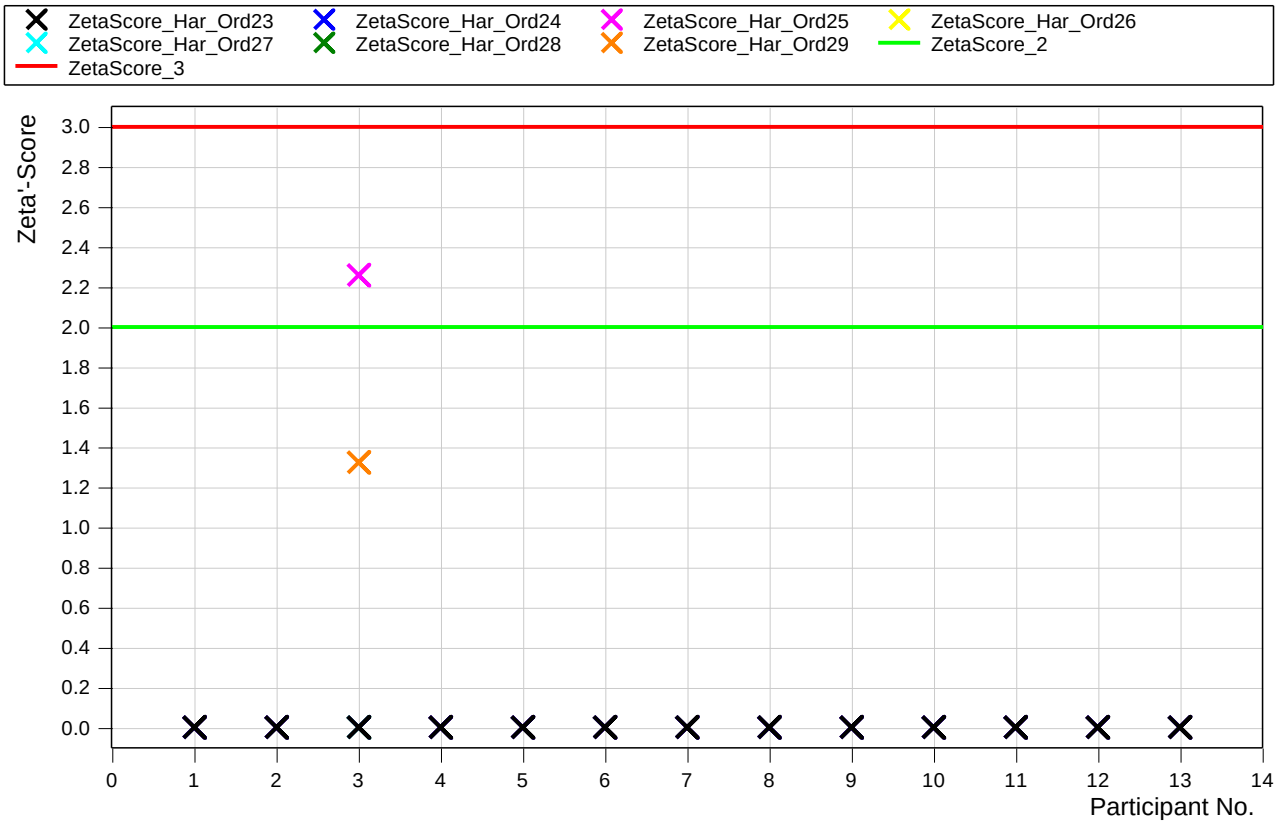
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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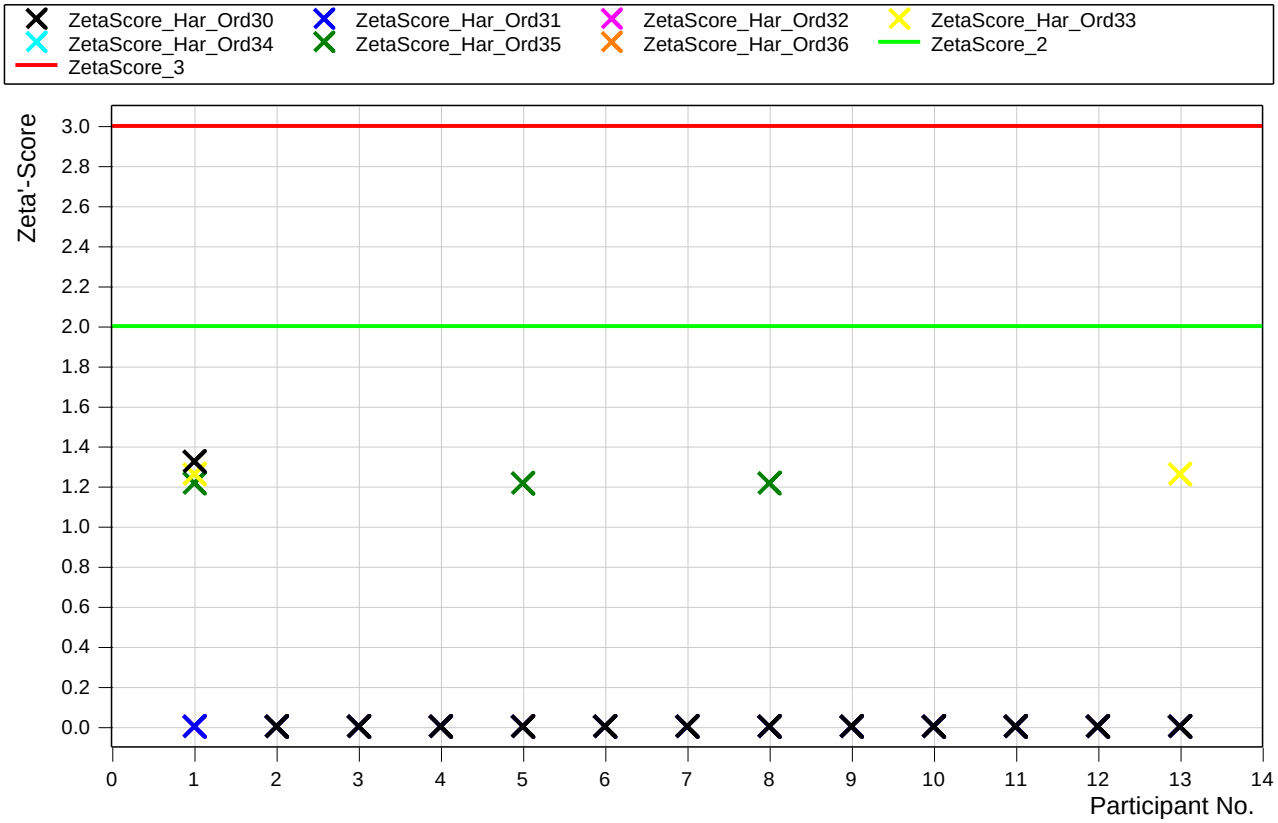
ZetaScore_Har_Ord29
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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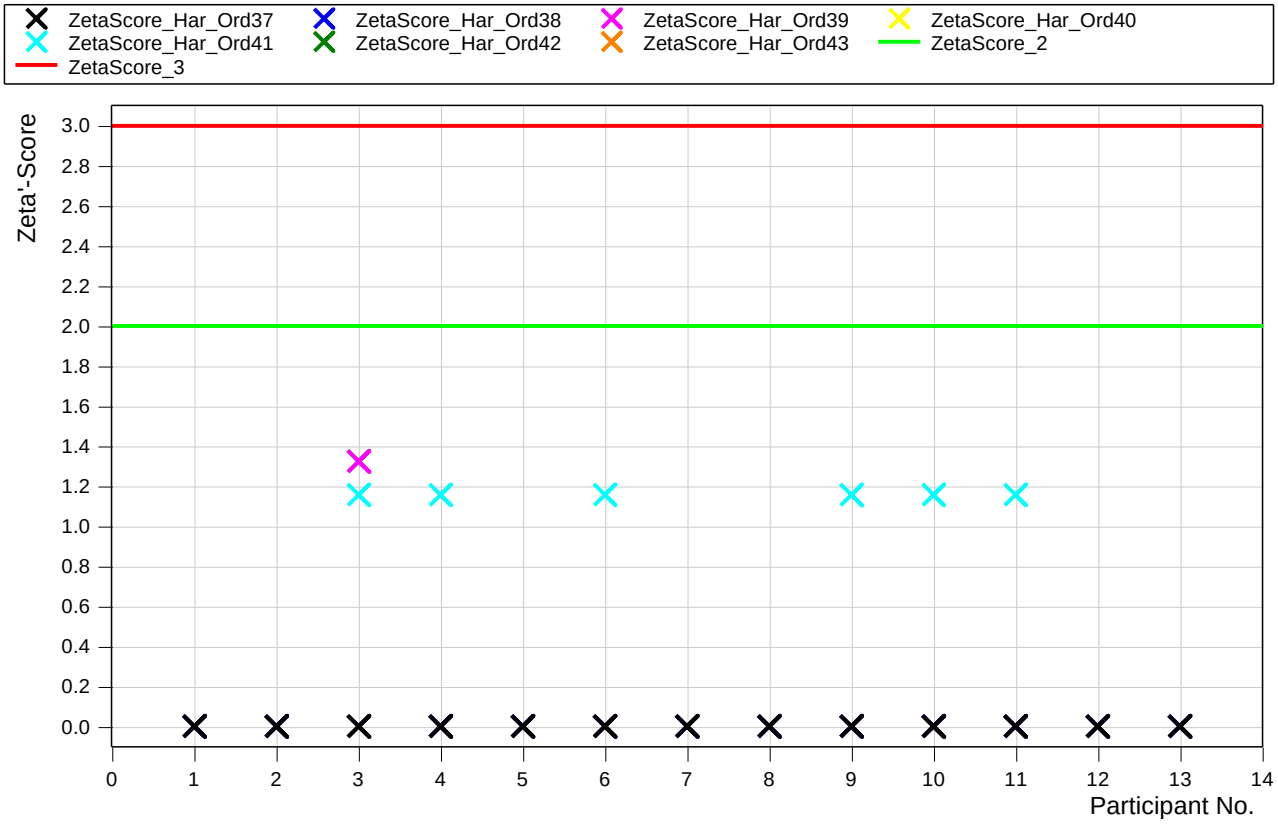
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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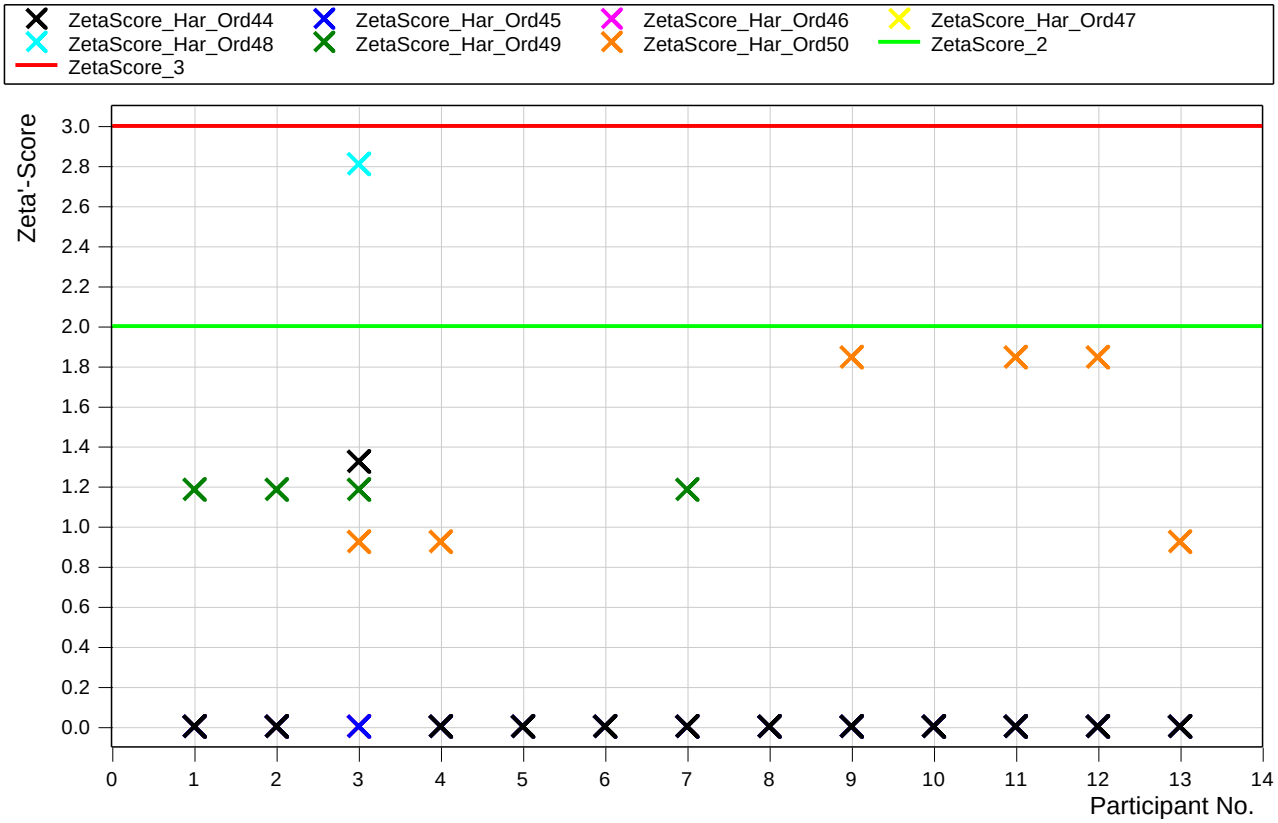
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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ZetaScore_Har_Ord50
ZetaScore_2
ZetaScore_3
Zeta'-Score
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Participant No.

### Task 6.2 (Interharmonics)

The following table shows the delivered results of the participants and the corresponding statistics. In this task, no participant is located in the red level. One participant is located in the yellow level. Values with grey background are only informative and not considered for the evaluation of the level of compliance.

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 75 Hz | f = 125 Hz | f = 175 Hz | f = 225 Hz | f = 275 Hz | f = 325 Hz | f = 375 Hz | f = 425 Hz | f = 475 Hz |
| 1 | 0581 | 0.31 | 0.06 | 0.05 | 0.04 | 0.06 | 0.05 | 0.05 | 0.04 | 0.03 |
| 2 | 0857 | 0.31 | 0.06 | 0.04 | 0.03 | 0.05 | 0.05 | 0.05 | 0.03 | 0.03 |
| 3 | 1136 | 0.26 | 0.04 | 0.03 | 0.02 | 0.05 | 0.03 | 0.04 | 0.03 | 0.02 |
| 4 | 2033 | 0.28 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 5 | 2546 | 0.28 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 6 | 3866 | 0.27 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 7 | 4515 | 0.31 | 0.06 | 0.04 | 0.03 | 0.05 | 0.05 | 0.05 | 0.03 | 0.03 |
| 8 | 4803 | 0.27 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 9 | 6432 | 0.27 | 0.05 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 10 | 6805 | 0.27 | 0.05 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 11 | 8373 | 0.27 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 12 | 8418 | 0.27 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| 13 | 8819 | 0.32 | 0.07 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.03 | 0.02 |
| Statistics (all participants) | Median | 0.27 | 0.04 | 0.03 | 0.03 | 0.05 | 0.04 | 0.04 | 0.03 | 0.02 |
| | Min | 0.26 | 0.04 | 0.03 | 0.02 | 0.05 | 0.03 | 0.04 | 0.03 | 0.02 |
| | Max | 0.32 | 0.07 | 0.05 | 0.04 | 0.06 | 0.05 | 0.05 | 0.04 | 0.03 |
| | Standard Deviation | 0.020 | 0.010 | 0.006 | 0.005 | 0.003 | 0.006 | 0.005 | 0.003 | 0.004 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.020 | 0.010 | 0.006 | 0.005 | 0.003 | 0.006 | 0.005 | 0.003 | 0.004 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 525 Hz | f = 575 Hz | f = 625 Hz | f = 675 Hz | f = 725 Hz | f = 775 Hz | f = 825 Hz | f = 875 Hz | f = 925 Hz |
| 1 | 0581 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 2 | 0857 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 3 | 1136 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 4 | 2033 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 5 | 2546 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 6 | 3866 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 7 | 4515 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 8 | 4803 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 9 | 6432 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 10 | 6805 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 11 | 8373 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 12 | 8418 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| 13 | 8819 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Statistics (all participants) | Median | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | Min | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | Max | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | Standard Deviation | 0.000 | 0.003 | 0.005 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.003 | 0.005 | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 975 Hz | f = 1,025 Hz | f = 1,075 Hz | f = 1,125 Hz | f = 1,175 Hz | f = 1,225 Hz | f = 1,275 Hz | f = 1,325 Hz | f = 1,375 Hz |
| 1 | 0581 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| 2 | 0857 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 3 | 1136 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 4 | 2033 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 5 | 2546 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 6 | 3866 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 7 | 4515 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 8 | 4803 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 9 | 6432 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 10 | 6805 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 11 | 8373 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 12 | 8418 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| 13 | 8819 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| Statistics (all participants) | Median | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| | Min | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| | Max | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| | Standard Deviation | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 1,425 Hz | f = 1,475 Hz | f = 1,525 Hz | f = 1,575 Hz | f = 1,625 Hz | f = 1,675 Hz | f = 1,725 Hz | f = 1,775 Hz | f = 1,825 Hz |
| 1 | 0581 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 2 | 0857 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 3 | 1136 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 5 | 2546 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 6 | 3866 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 7 | 4515 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 8 | 4803 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 9 | 6432 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 10 | 6805 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 11 | 8373 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 12 | 8418 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 13 | 8819 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| Statistics (all participants) | Median | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| | Min | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| | Standard Deviation | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Interharmonic currents ($I_h$ / $I_n$ [%]) | | | |
|---|---|---|---|---|---|
| No. | ID | f = 1,875 Hz | f = 1,925 Hz | f = 1,975 Hz | Bin assignment OK |
| 1 | 0581 | 0.00 | 0.01 | 0.01 | Yes |
| 2 | 0857 | 0.00 | 0.00 | 0.01 | Yes |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | Yes |
| 4 | 2033 | 0.00 | 0.00 | 0.01 | Yes |
| 5 | 2546 | 0.00 | 0.00 | 0.01 | Yes |
| 6 | 3866 | 0.00 | 0.00 | 0.01 | Yes |
| 7 | 4515 | 0.00 | 0.00 | 0.01 | Yes |
| 8 | 4803 | 0.00 | 0.00 | 0.01 | Yes |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | Yes |
| 10 | 6805 | 0.00 | 0.00 | 0.01 | Yes |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | Yes |
| 12 | 8418 | 0.00 | 0.00 | 0.01 | Yes |
| 13 | 8819 | 0.00 | 0.01 | 0.01 | Yes |
| Statistics (all participants) | Median | 0.00 | 0.00 | 0.01 | -- |
| | Min | 0.00 | 0.00 | 0.00 | -- |
| | Max | 0.00 | 0.01 | 0.01 | -- |
| | Standard Deviation | 0.000 | 0.004 | 0.004 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.004 | 0.004 | -- |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | -- |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | -- |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 75 Hz | f = 125 Hz | f = 175 Hz | f = 225 Hz | f = 275 Hz | f = 325 Hz | f = 375 Hz | f = 425 Hz | f = 475 Hz |
| 1 | 0581 | 1.90 | 1.60 | 2.12 | 1.17 | 1.32 | 1.10 | 1.18 | 1.32 | 1.21 |
| 2 | 0857 | 1.90 | 1.60 | 1.06 | 0.00 | 0.00 | 1.10 | 1.18 | 0.00 | 1.21 |
| 3 | 1136 | 0.48 | 0.00 | 0.00 | 1.17 | 0.00 | 1.10 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 1.90 | 1.60 | 1.06 | 0.00 | 0.00 | 1.10 | 1.18 | 0.00 | 1.21 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 2.38 | 2.41 | 1.06 | 1.17 | 0.00 | 1.10 | 1.18 | 0.00 | 0.00 |

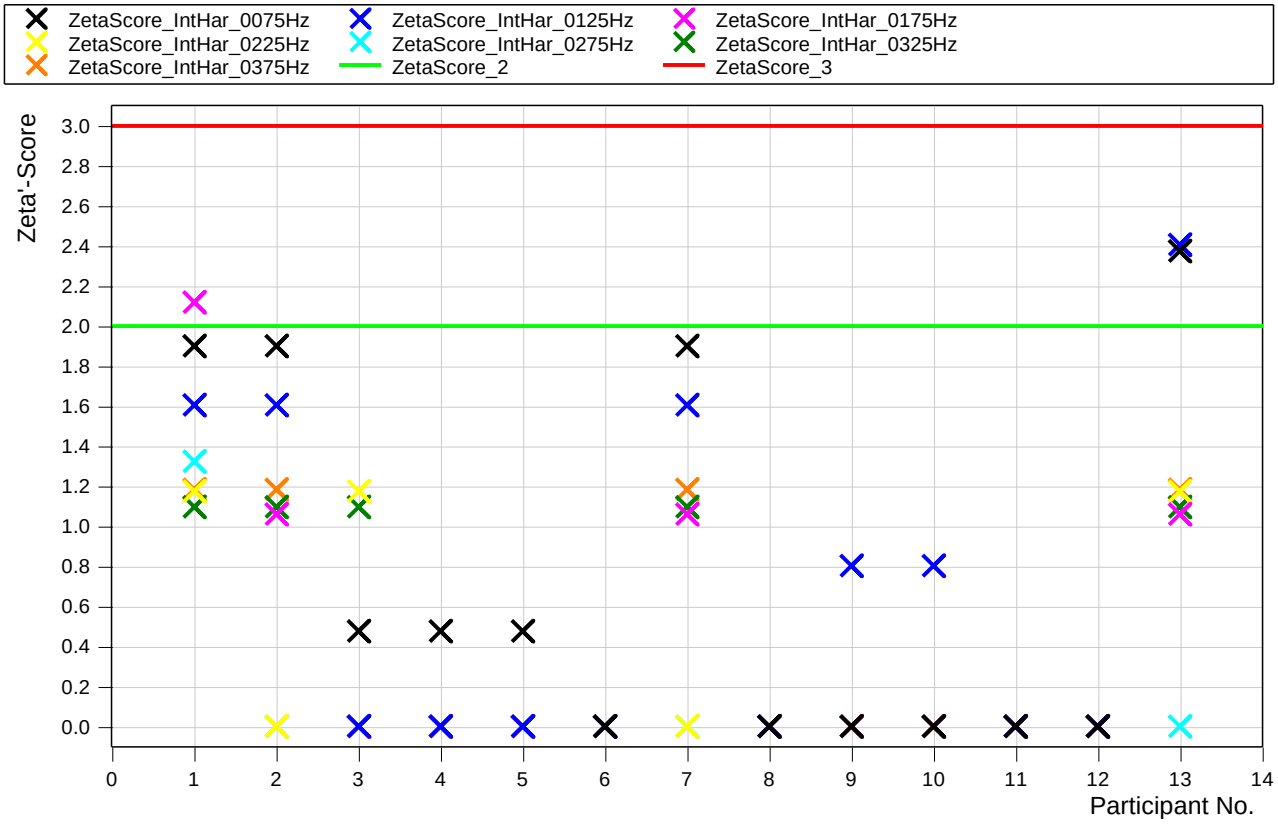
| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 525 Hz | f = 575 Hz | f = 625 Hz | f = 675 Hz | f = 725 Hz | f = 775 Hz | f = 825 Hz | f = 875 Hz | f = 925 Hz |
| 1 | 0581 | 0.00 | 0.00 | 1.16 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

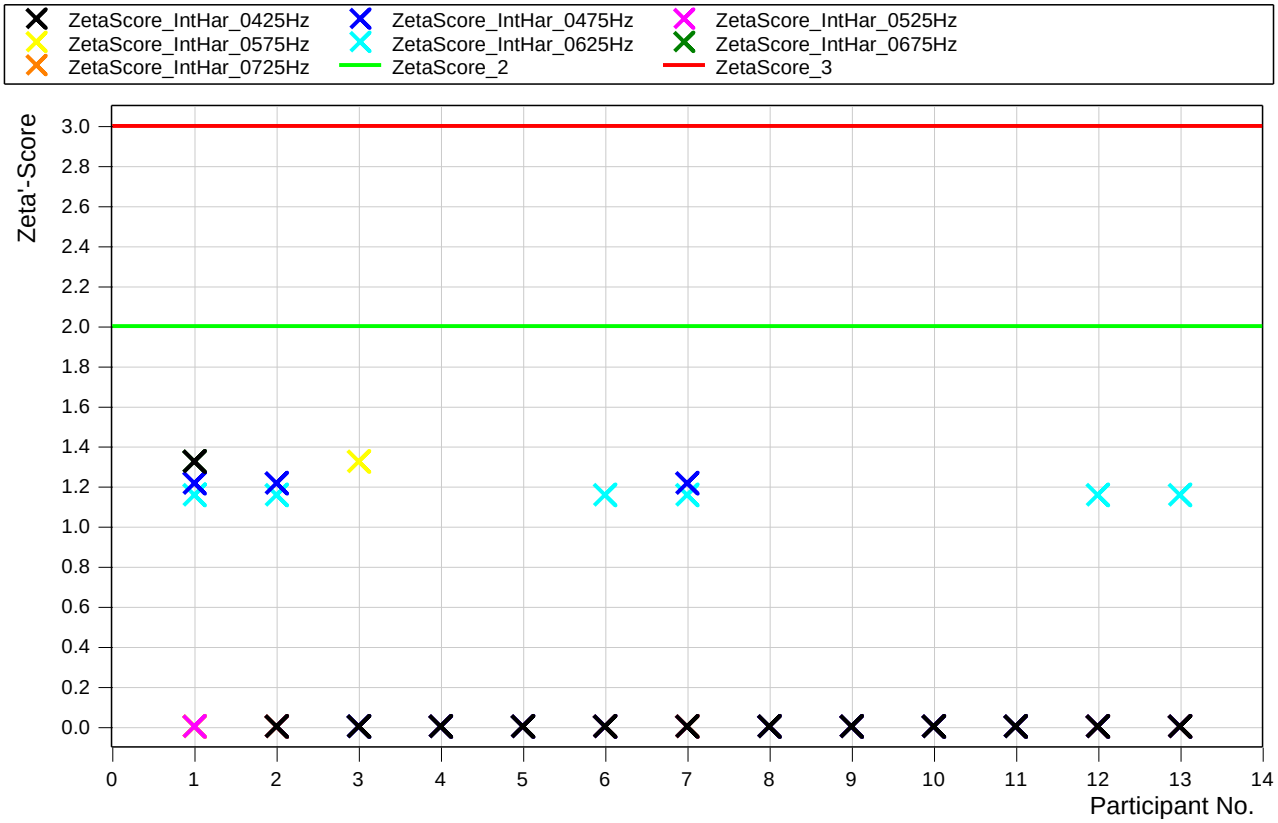
The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 975 Hz | f = 1,025 Hz | f = 1,075 Hz | f = 1,125 Hz | f = 1,175 Hz | f = 1,225 Hz | f = 1,275 Hz | f = 1,325 Hz | f = 1,375 Hz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Interharmonic currents | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 1,425 Hz | f = 1,475 Hz | f = 1,525 Hz | f = 1,575 Hz | f = 1,625 Hz | f = 1,675 Hz | f = 1,725 Hz | f = 1,775 Hz | f = 1,825 Hz |
| 1 | 0581 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Interharmonic currents | | | | |
|---|---|---|---|---|---|---|
| No. | ID | f = 1,875 Hz | f = 1,925 Hz | f = 1,975 Hz | Bin assignment OK | Level of compliance (overall task 6.2) |
| 1 | 0581 | 0.00 | 1.26 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.00 | 0.00 | 1.21 | Yes | |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | Yes | |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | Yes | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 0.00 | 0.00 | 1.21 | Yes | |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | Yes | |
| 11 | 8373 | 0.00 | 0.00 | 1.21 | Yes | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | Yes | |
| 13 | 8819 | 0.00 | 1.26 | 0.00 | Yes | |

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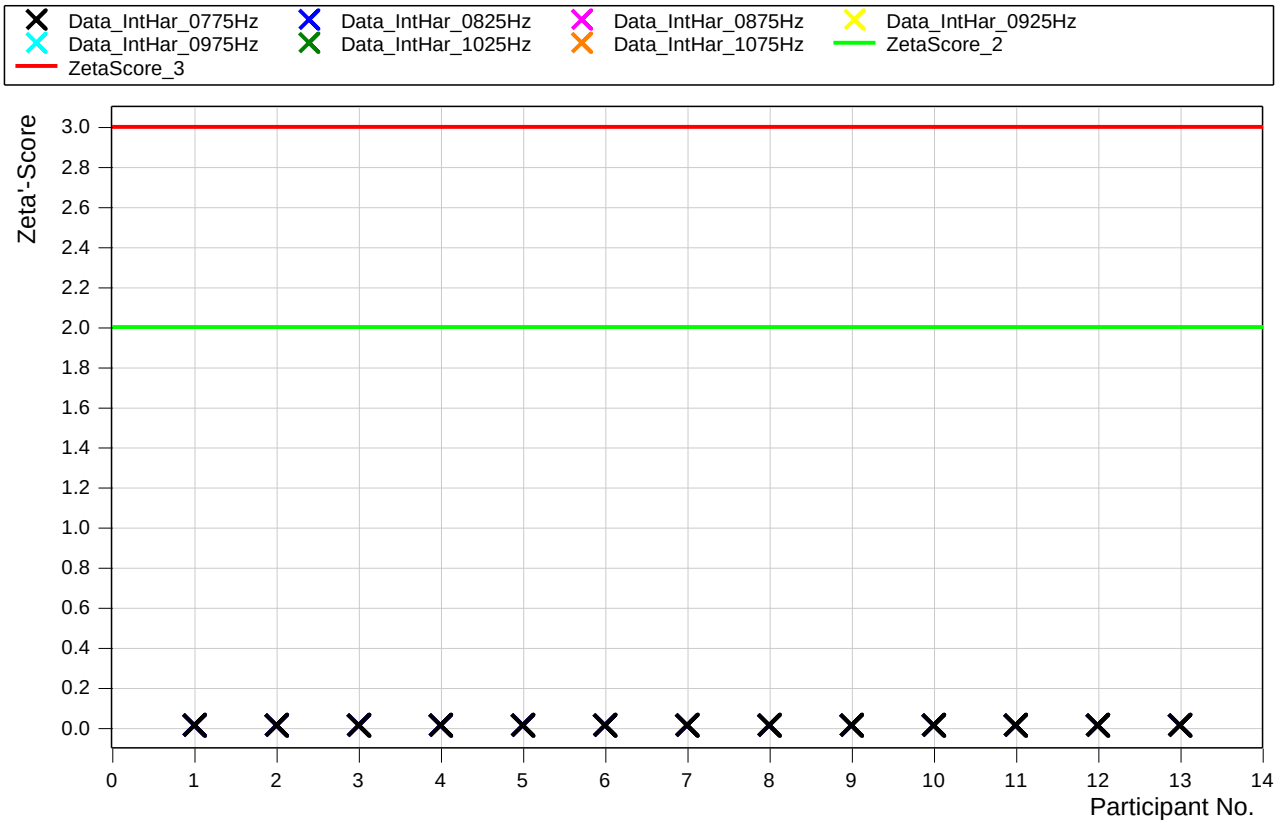
ZetaScore_IntHar_0475Hz
ZetaScore_IntHar_0525Hz
ZetaScore_IntHar_0575Hz
ZetaScore_IntHar_0625Hz
ZetaScore_IntHar_0675Hz
ZetaScore_IntHar_0725Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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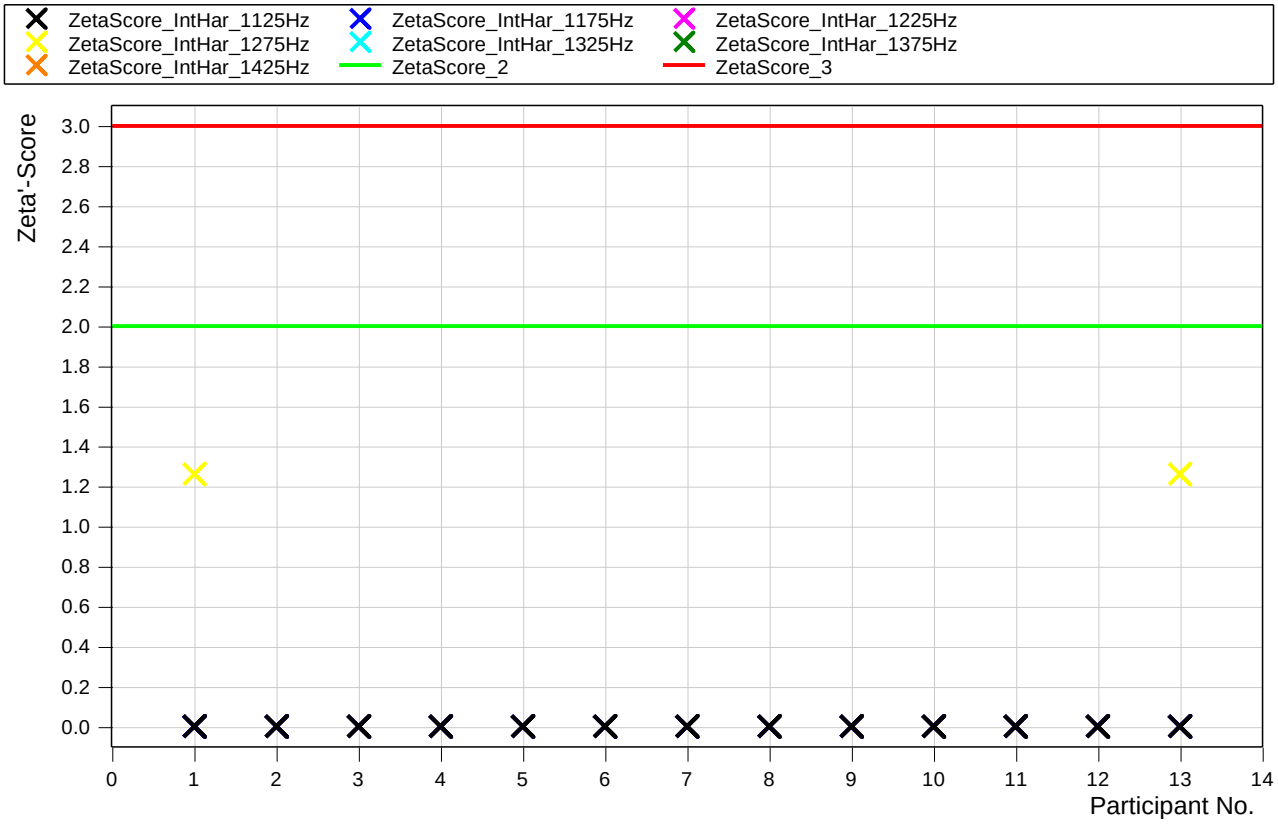
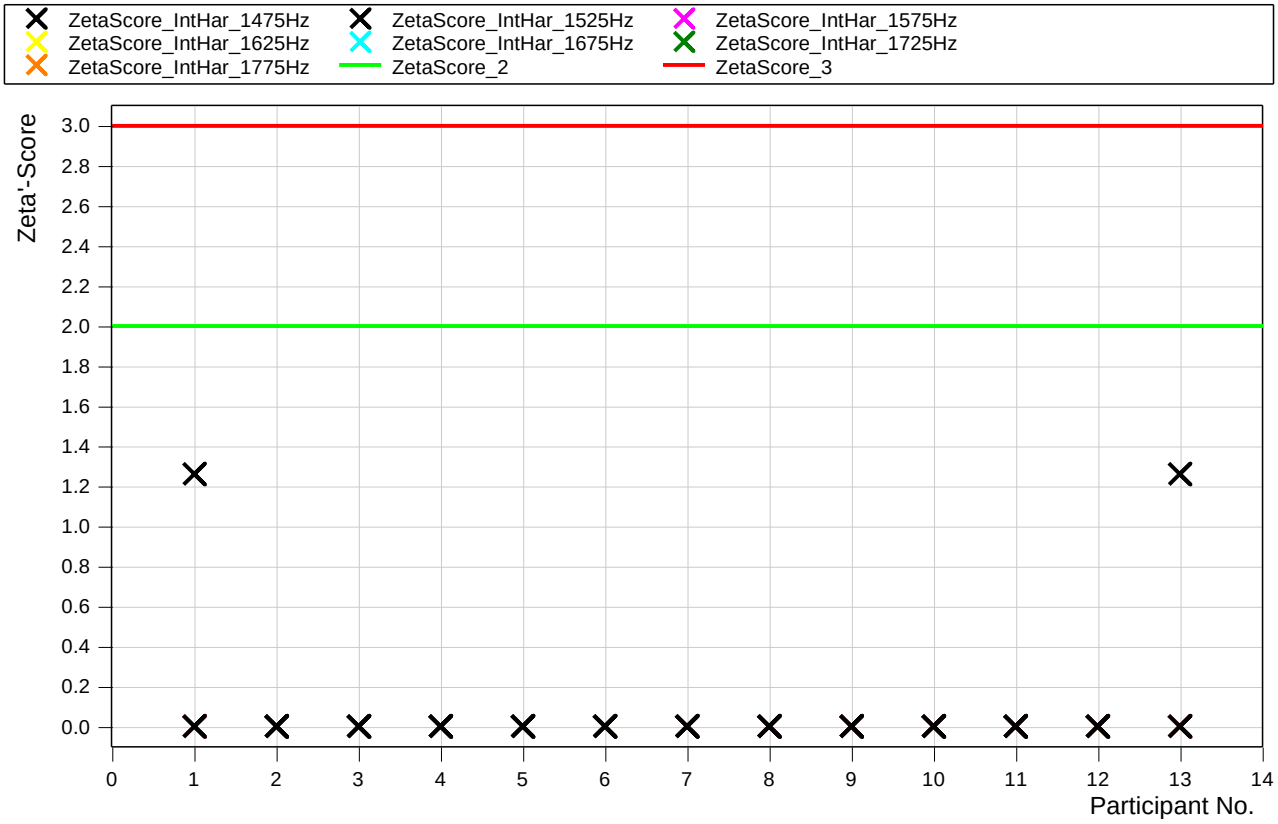
Data_IntHar_0825Hz
Data_IntHar_0875Hz
Data_IntHar_0925Hz
Data_IntHar_0975Hz
Data_IntHar_1025Hz
Data_IntHar_1075Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_IntHar_1125Hz
ZetaScore_IntHar_1175Hz
ZetaScore_IntHar_1225Hz
ZetaScore_IntHar_1275Hz
ZetaScore_IntHar_1325Hz
ZetaScore_IntHar_1375Hz
ZetaScore_IntHar_1425Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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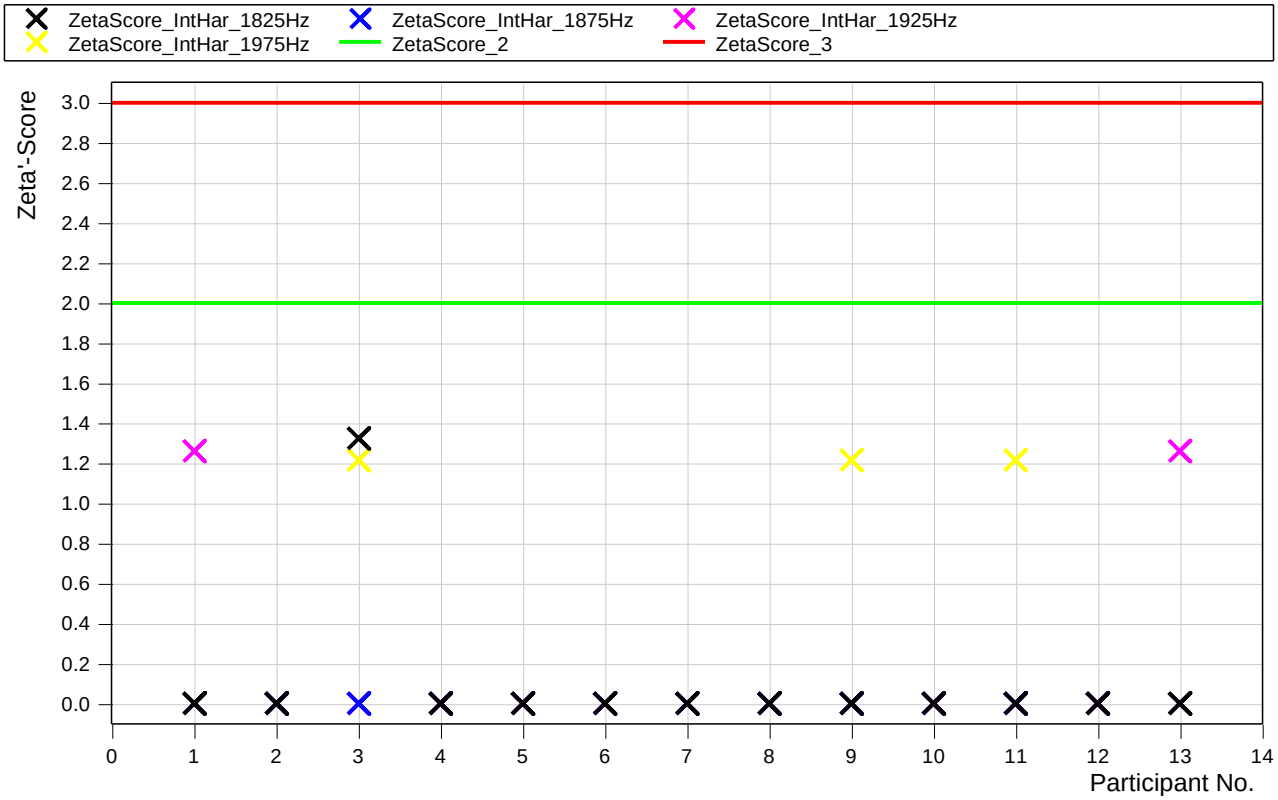
ZetaScore_IntHar_1525Hz
ZetaScore_IntHar_1575Hz
ZetaScore_IntHar_1625Hz
ZetaScore_IntHar_1675Hz
ZetaScore_IntHar_1725Hz
ZetaScore_IntHar_1775Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_IntHar_1825Hz
ZetaScore_IntHar_1875Hz
ZetaScore_IntHar_1925Hz
ZetaScore_IntHar_1975Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Participant No.

### Task 6.3 (Higher frequency components of current)

The following table shows the delivered results of the participants and the corresponding statistics. In this task, no participant is located in the red level. One participant is located in the yellow level. Values with grey background are only informative and not considered for the evaluation of the level of compliance.

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 2.1 kHz | f = 2.3 kHz | f = 2.5 kHz | f = 2.7 kHz | f = 2.9 kHz | f = 3.1 kHz | f = 3.3 kHz | f = 3.5 kHz | f = 3.7 kHz |
| 1 | 0581 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 2 | 0857 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 3 | 1136 | 0.01 | 0.04 | 0.22 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 4 | 2033 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 5 | 2546 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 6 | 3866 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 7 | 4515 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 8 | 4803 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 9 | 6432 | 0.01 | 0.07 | 0.22 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 10 | 6805 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 11 | 8373 | 0.01 | 0.07 | 0.22 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 12 | 8418 | 0.01 | 0.07 | 0.22 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 13 | 8819 | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| Statistics (all participants) | Assigned value | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| | Min | 0.01 | 0.04 | 0.22 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| | Max | 0.01 | 0.07 | 0.23 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| | Standard Deviation | 0.000 | 0.008 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.000 | 0.008 | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.004 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 3.9 kHz | f = 4.1 k Hz | f = 4.3 kHz | f = 4.5 kHz | f = 4.7 kHz | f = 4.9 kHz | f = 5.1 kHz | f = 5.3 kHz | f = 5.5 kHz |
| 1 | 0581 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 2 | 0857 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 3 | 1136 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.09 | 0.10 | 0.01 | 0.01 |
| 4 | 2033 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 5 | 2546 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 6 | 3866 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 7 | 4515 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 8 | 4803 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 9 | 6432 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.11 | 0.11 | 0.01 | 0.02 |
| 10 | 6805 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| 11 | 8373 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.11 | 0.11 | 0.01 | 0.01 |
| 12 | 8418 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.12 | 0.11 | 0.01 | 0.01 |
| 13 | 8819 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| Statistics (all participants) | Assigned value | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.01 |
| | Min | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.09 | 0.10 | 0.01 | 0.01 |
| | Max | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.14 | 0.14 | 0.01 | 0.02 |
| | Standard Deviation | 0.004 | 0.004 | 0.000 | 0.000 | 0.000 | 0.016 | 0.015 | 0.000 | 0.003 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.004 | 0.004 | 0.000 | 0.000 | 0.000 | 0.016 | 0.015 | 0.000 | 0.003 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 5.7 kHz | f = 5.9 kHz | f = 6.1 kHz | f = 6.3 kHz | f = 6.5 kHz | f = 6.7 kHz | f = 6.9 kHz | f = 7.1 kHz | f = 7.3 kHz |
| 1 | 0581 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 2 | 0857 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 3 | 1136 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 |
| 4 | 2033 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 5 | 2546 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 6 | 3866 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 7 | 4515 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 8 | 4803 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 9 | 6432 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 |
| 10 | 6805 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 |
| 12 | 8418 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 |
| 13 | 8819 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| Statistics (all participants) | Assigned value | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| | Min | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 |
| | Max | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 |
| | Standard Deviation | 0.003 | 0.005 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.000 | 0.005 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.003 | 0.005 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.000 | 0.005 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

| Participant | | Higher frequency components of current ($I_h$ / $I_n$ [%]) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 7.5 kHz | f = 7.7 kHz | f = 7.9 kHz | f = 8.1 kHz | f = 8.3 kHz | f = 8.5 kHz | f = 8.7 kHz | f = 8.9 kHz | Bin assign-ment OK |
| 1 | 0581 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| 2 | 0857 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| 3 | 1136 | 0.08 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | Yes |
| 4 | 2033 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | Yes |
| 5 | 2546 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | Yes |
| 6 | 3866 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| 7 | 4515 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| 8 | 4803 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| 9 | 6432 | 0.05 | 0.03 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | Yes |
| 10 | 6805 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| 11 | 8373 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes |
| 12 | 8418 | 0.06 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | Yes |
| 13 | 8819 | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | Yes |
| Statistics (all participants) | Assigned value | 0.08 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | -- |
| | Min | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| | Max | 0.08 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | -- |
| | Standard Deviation | 0.011 | 0.005 | 0.004 | 0.003 | 0.004 | 0.005 | 0.004 | 0.004 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.011 | 0.005 | 0.004 | 0.003 | 0.004 | 0.005 | 0.004 | 0.004 | -- |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | -- |
| | $\sigma_p$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | -- |

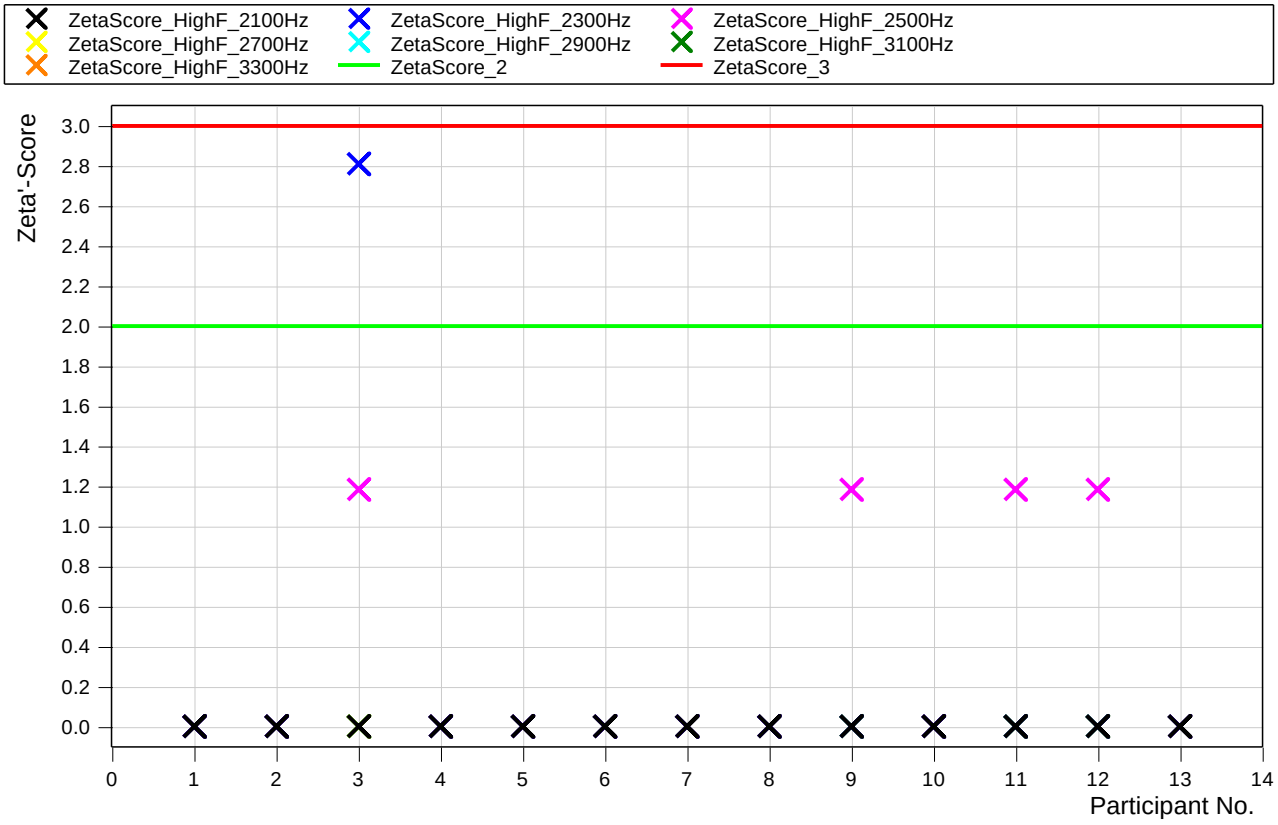
The following tables and figures show the results of the Zeta' Score calculation.

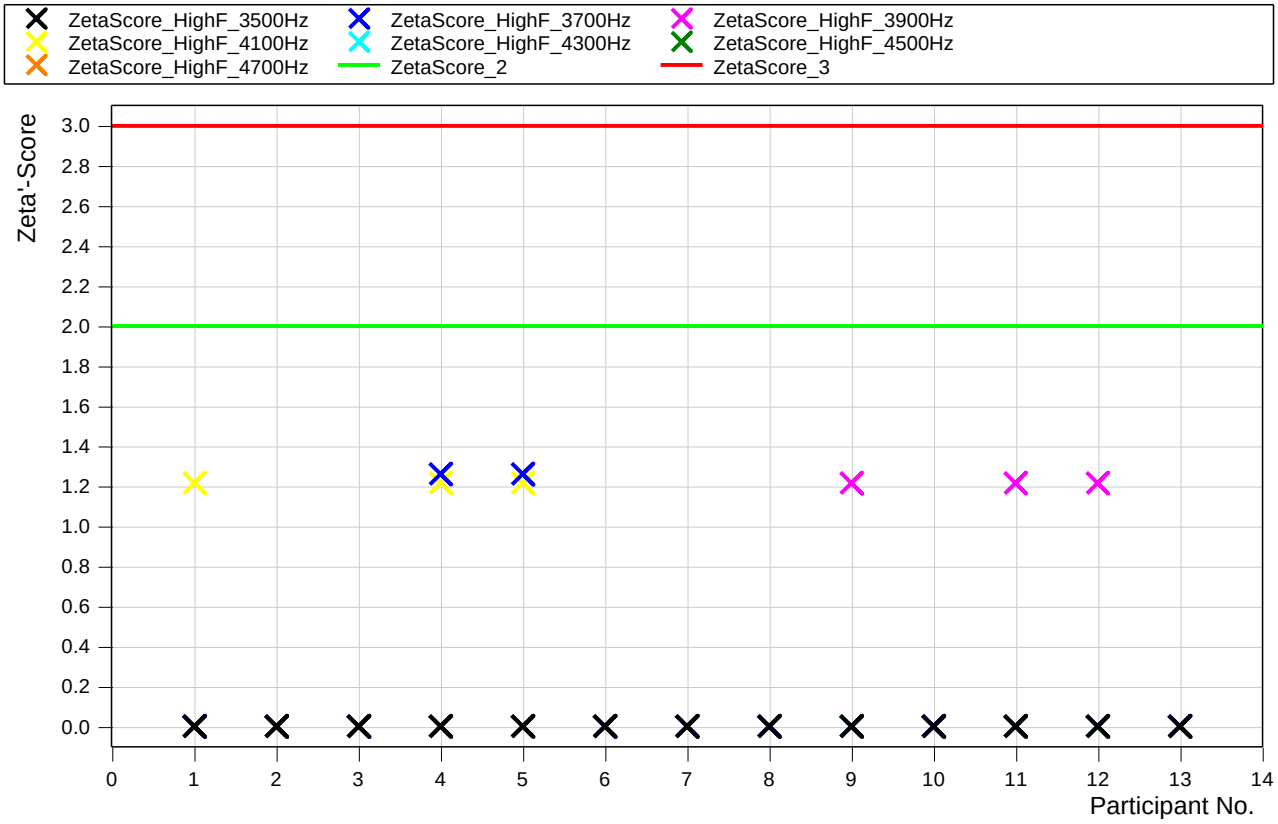
| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 2.1 kHz | f = 2.3 kHz | f = 2.5 kHz | f = 2.7 kHz | f = 2.9 kHz | f = 3.1 kHz | f = 3.3 kHz | f = 3.5 kHz | f = 3.7 kHz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 2.81 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

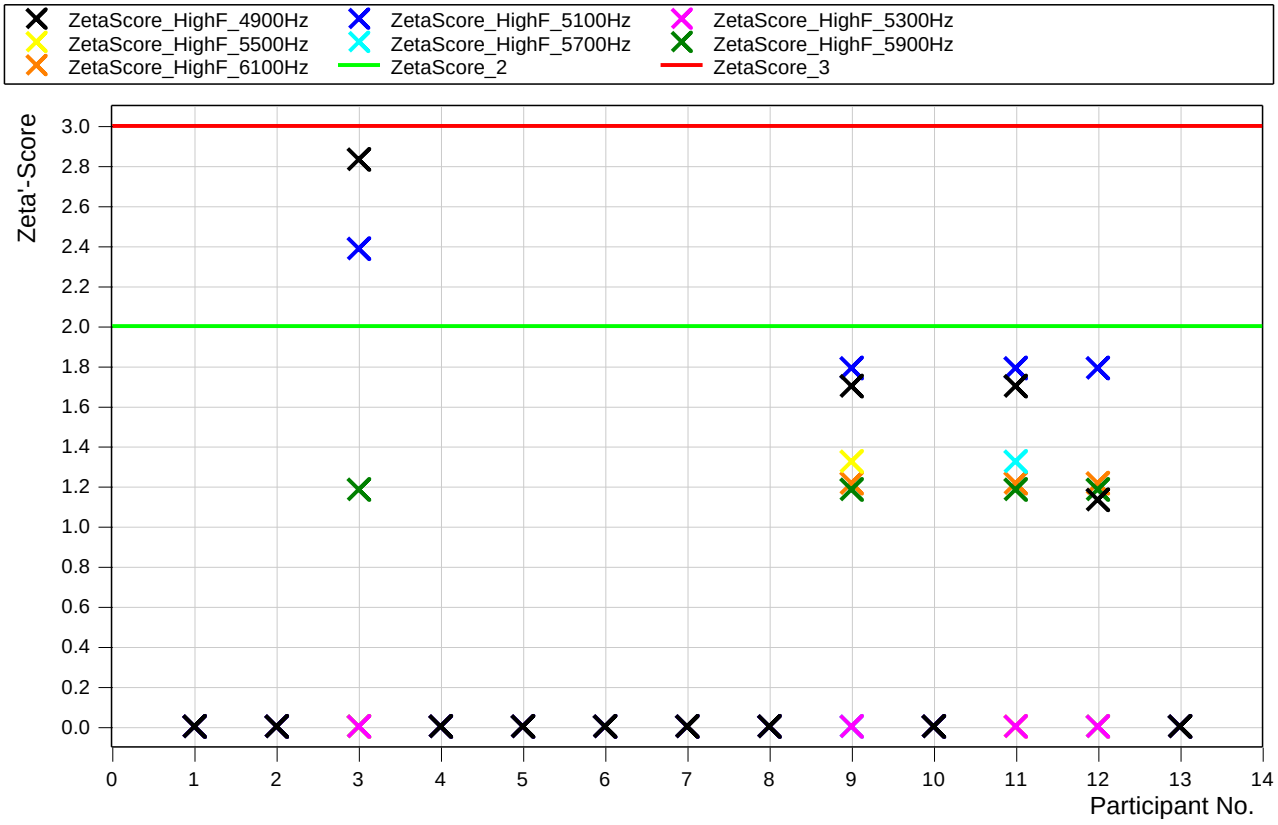
| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 3.9 kHz | f = 4.1 k Hz | f = 4.3 kHz | f = 4.5 kHz | f = 4.7 kHz | f = 4.9 kHz | f = 5.1 kHz | f = 5.3 kHz | f = 5.5 kHz |
| 1 | 0581 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.83 | 2.39 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 1.70 | 1.79 | 0.00 | 1.32 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 1.70 | 1.79 | 0.00 | 0.00 |
| 12 | 8418 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 1.13 | 1.79 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

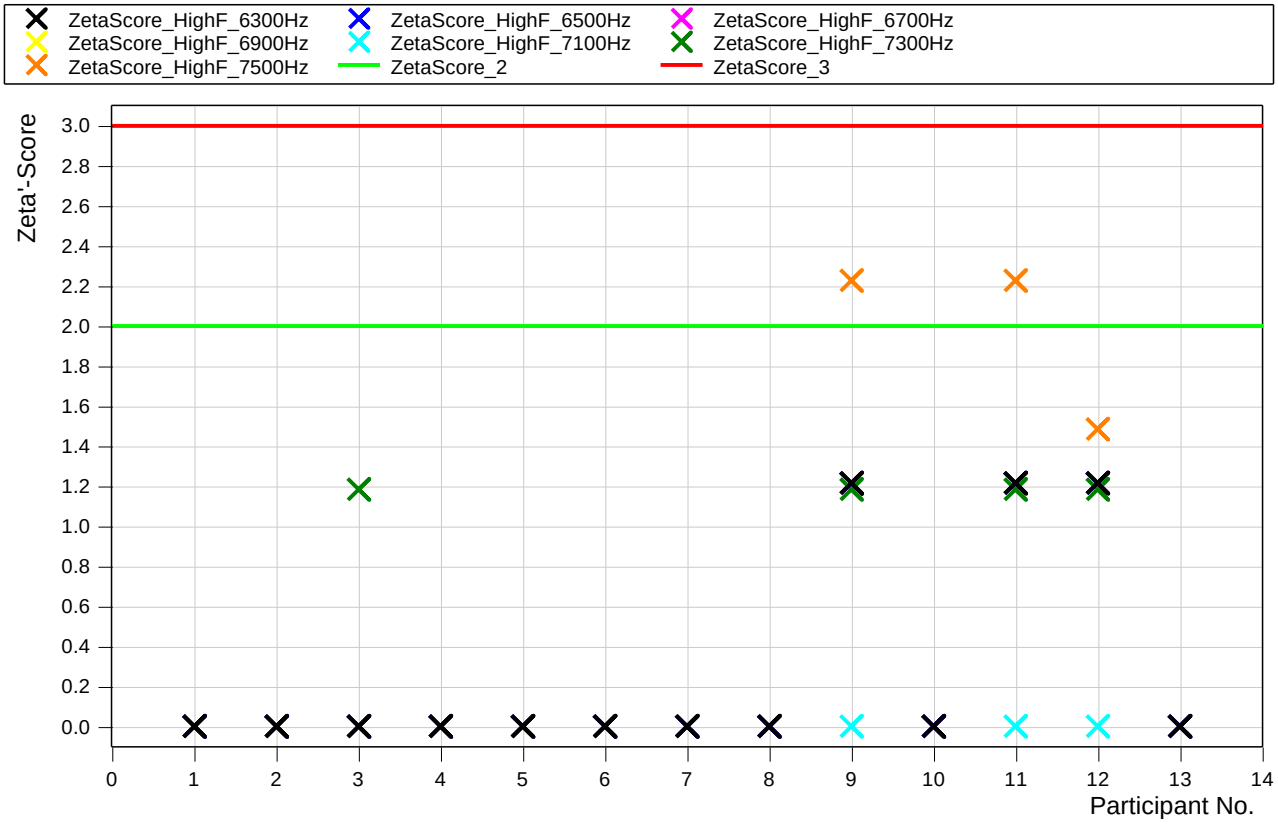
| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 5.7 kHz | f = 5.9 kHz | f = 6.1 kHz | f = 6.3 kHz | f = 6.5 kHz | f = 6.7 kHz | f = 6.9 kHz | f = 7.1 kHz | f = 7.3 kHz |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 1.18 | 1.21 | 1.21 | 1.21 | 1.21 | 1.21 | 0.00 | 1.18 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 1.32 | 1.18 | 1.21 | 1.21 | 1.21 | 1.21 | 1.21 | 0.00 | 1.18 |
| 12 | 8418 | 0.00 | 1.18 | 1.21 | 1.21 | 1.21 | 1.21 | 1.21 | 0.00 | 1.18 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

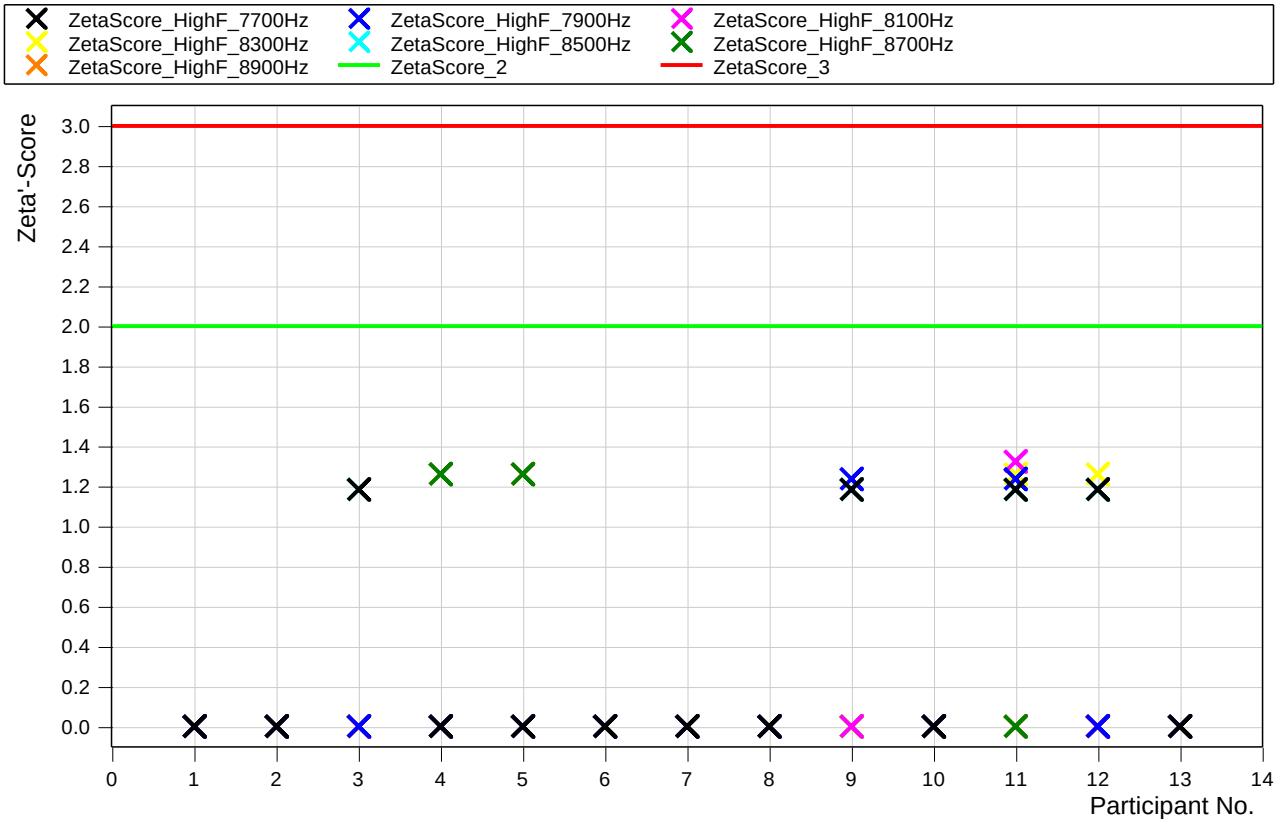
| Participant | | Zeta' Score - Higher frequency components of current | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | f = 7.5 kHz | f = 7.7 kHz | f = 7.9 kHz | f = 8.1 kHz | f = 8.3 kHz | f = 8.5 kHz | f = 8.7 kHz | f = 8.9 kHz | Bin assign-ment OK | Level of com-pliance (overall task 6.3) |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 | Yes | |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 1.26 | Yes | |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 1.26 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 2.23 | 1.18 | 1.24 | 0.00 | 0.00 | 1.18 | 0.00 | 0.00 | Yes | |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 11 | 8373 | 2.23 | 1.18 | 1.24 | 1.32 | 1.26 | 1.18 | 0.00 | 0.00 | Yes | |
| 12 | 8418 | 1.49 | 1.18 | 0.00 | 0.00 | 1.26 | 1.18 | 0.00 | 0.00 | Yes | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |


ZetaScore_HighF_2100Hz
ZetaScore_HighF_2300Hz
ZetaScore_HighF_2500Hz
ZetaScore_HighF_2700Hz
ZetaScore_HighF_2900Hz
ZetaScore_HighF_3100Hz
ZetaScore_HighF_3300Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_HighF_3500Hz
ZetaScore_HighF_3700Hz
ZetaScore_HighF_3900Hz
ZetaScore_HighF_4100Hz
ZetaScore_HighF_4300Hz
ZetaScore_HighF_4500Hz
ZetaScore_HighF_4700Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_HighF_4900Hz
ZetaScore_HighF_5100Hz
ZetaScore_HighF_5300Hz
ZetaScore_HighF_5500Hz
ZetaScore_HighF_5700Hz
ZetaScore_HighF_5900Hz
ZetaScore_HighF_6100Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_HighF_6300Hz
ZetaScore_HighF_6500Hz
ZetaScore_HighF_6700Hz
ZetaScore_HighF_6900Hz
ZetaScore_HighF_7100Hz
ZetaScore_HighF_7300Hz
ZetaScore_HighF_7500Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.


ZetaScore_HighF_7700Hz
ZetaScore_HighF_7900Hz
ZetaScore_HighF_8100Hz
ZetaScore_HighF_8300Hz
ZetaScore_HighF_8500Hz
ZetaScore_HighF_8700Hz
ZetaScore_HighF_8900Hz
ZetaScore_2
ZetaScore_3
Zeta'-Score
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Participant No.

## 6.7. Task 7 – Maximum power

Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3.

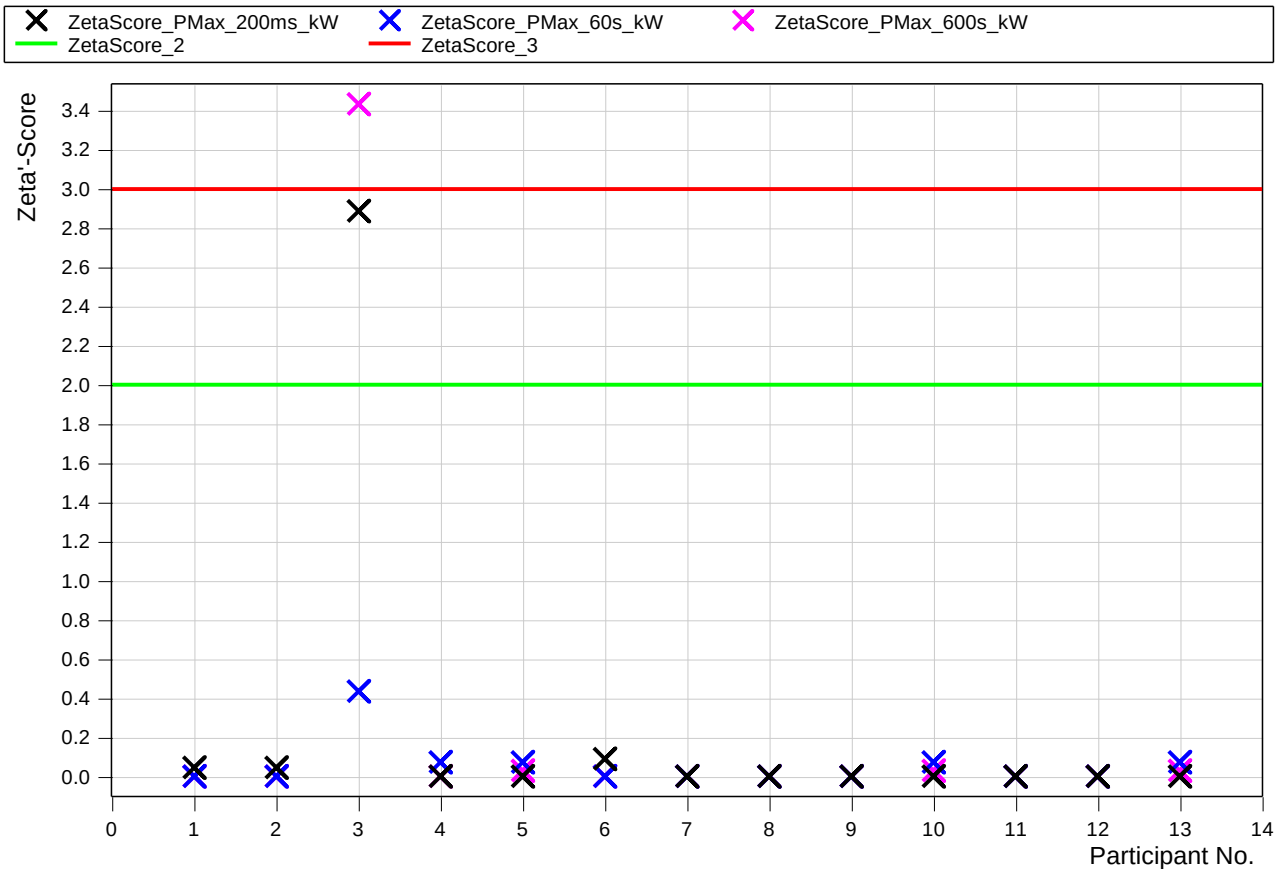
**Results for data delivered in "kW":**

The following table shows the delivered results of the participants and the corresponding statistics. One participant is located in the red level. No participant is located in the yellow level.

| Participant | | $P_x$ [kW] | | |
|---|---|---|---|---|
| No. | ID | x = 0.2 s | x = 60 s | x = 600 s |
| 1 | 0581 | 5701 | 5484 | 5455 |
| 2 | 0857 | 5701 | 5484 | 5455 |
| 3 | 1136 | 5635 | 5478 | 5340 |
| 4 | 2033 | 5700 | 5483 | 5455 |
| 5 | 2546 | 5700 | 5483 | 5454 |
| 6 | 3866 | 5702 | 5484 | 5455 |
| 7 | 4515 | 5700 | 5484 | 5455 |
| 8 | 4803 | 5700 | 5484 | 5455 |
| 9 | 6432 | 5700 | 5484 | 5455 |
| 10 | 6805 | 5700 | 5483 | 5454 |
| 11 | 8373 | 5700 | 5484 | 5455 |
| 12 | 8418 | 5700 | 5484 | 5455 |
| 13 | 8819 | 5700 | 5483 | 5454 |
| Statistics (all participants) | Median | 5700 | 5484 | 5455 |
| | Min | 5635 | 5478 | 5340 |
| | Max | 5702 | 5484 | 5455 |
| | Standard Deviation | 17.42 | 1.58 | 30.58 |
| Statistics (successful participants) | Median | 5700 | 5484 | 5455 |
| | Min | 5700 | 5483 | 5454 |
| | Max | 5702 | 5484 | 5455 |
| | Standard Deviation | 0.624 | 0.471 | 0.433 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 17.42 | 1.58 | 30.58 |
| | $\sigma_d$ | 0.707 | 0.707 | 0.707 |
| | $\sigma_p$ | 14.25 | 13.71 | 13.64 |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - $P_x$ [kW] | | | Level of compliance (overall task 7, kW values) |
|---|---|---|---|---|---|
| No. | ID | x = 0.2 s | x = 60 s | x = 600 s | |
| 1 | 0581 | 0.04 | 0.00 | 0.00 | |
| 2 | 0857 | 0.04 | 0.00 | 0.00 | |
| 3 | 1136 | 2.89 | 0.43 | 3.43 | |
| 4 | 2033 | 0.00 | 0.07 | 0.00 | |
| 5 | 2546 | 0.00 | 0.07 | 0.03 | |
| 6 | 3866 | 0.09 | 0.00 | 0.00 | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | |
| 10 | 6805 | 0.00 | 0.07 | 0.03 | |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | |
| 13 | 8819 | 0.00 | 0.07 | 0.03 | |



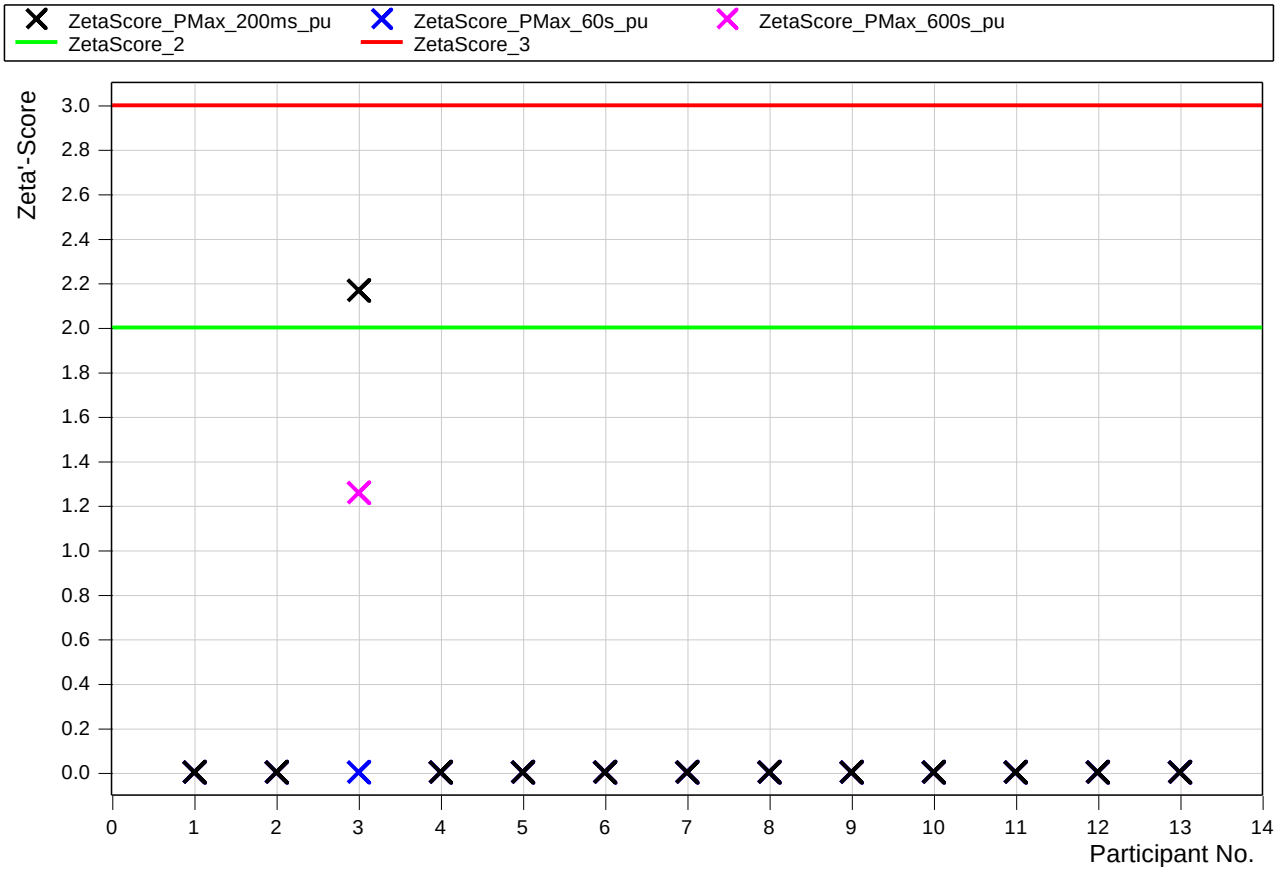
**Results for data delivered as normalized values:**

The following table shows the delivered results of the participants and the corresponding statistics. In this task no participant is located in the red level. One participant is located in the yellow level.

| Participant | | $P_x$ [p.u.] | | |
|---|---|---|---|---|
| No. | ID | x = 0.2 s | x = 60 s | x = 600 s |
| 1 | 0581 | 1.04 | 1.00 | 0.99 |
| 2 | 0857 | 1.04 | 1.00 | 0.99 |
| 3 | 1136 | 1.02 | 1.00 | 0.98 |
| 4 | 2033 | 1.04 | 1.00 | 0.99 |
| 5 | 2546 | 1.04 | 1.00 | 0.99 |
| 6 | 3866 | 1.04 | 1.00 | 0.99 |
| 7 | 4515 | 1.04 | 1.00 | 0.99 |
| 8 | 4803 | 1.04 | 1.00 | 0.99 |
| 9 | 6432 | 1.04 | 1.00 | 0.99 |
| 10 | 6805 | 1.04 | 1.00 | 0.99 |
| 11 | 8373 | 1.04 | 1.00 | 0.99 |
| 12 | 8418 | 1.04 | 1.00 | 0.99 |
| 13 | 8819 | 1.04 | 1.00 | 0.99 |
| Statistics (all participants) | Median | 1.04 | 1.00 | 0.99 |
| | Min | 1.02 | 1.00 | 0.98 |
| | Max | 1.04 | 1.00 | 0.99 |
| | Standard Deviation | 0.005 | 0.000 | 0.003 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.005 | 0.000 | 0.003 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | 0.003 | 0.003 | 0.002 |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - $P_x$ [p.u.] | | | Level of compliance (overall task 7, p.u. values) |
|---|---|---|---|---|---|
| No. | ID | x = 0.2 s | x = 60 s | x = 600 s | |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | |
| 3 | 1136 | 2.17 | 0.00 | 1.26 | |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | |



## 6.8. Task 8 – Reactive power characteristics (Q=0)

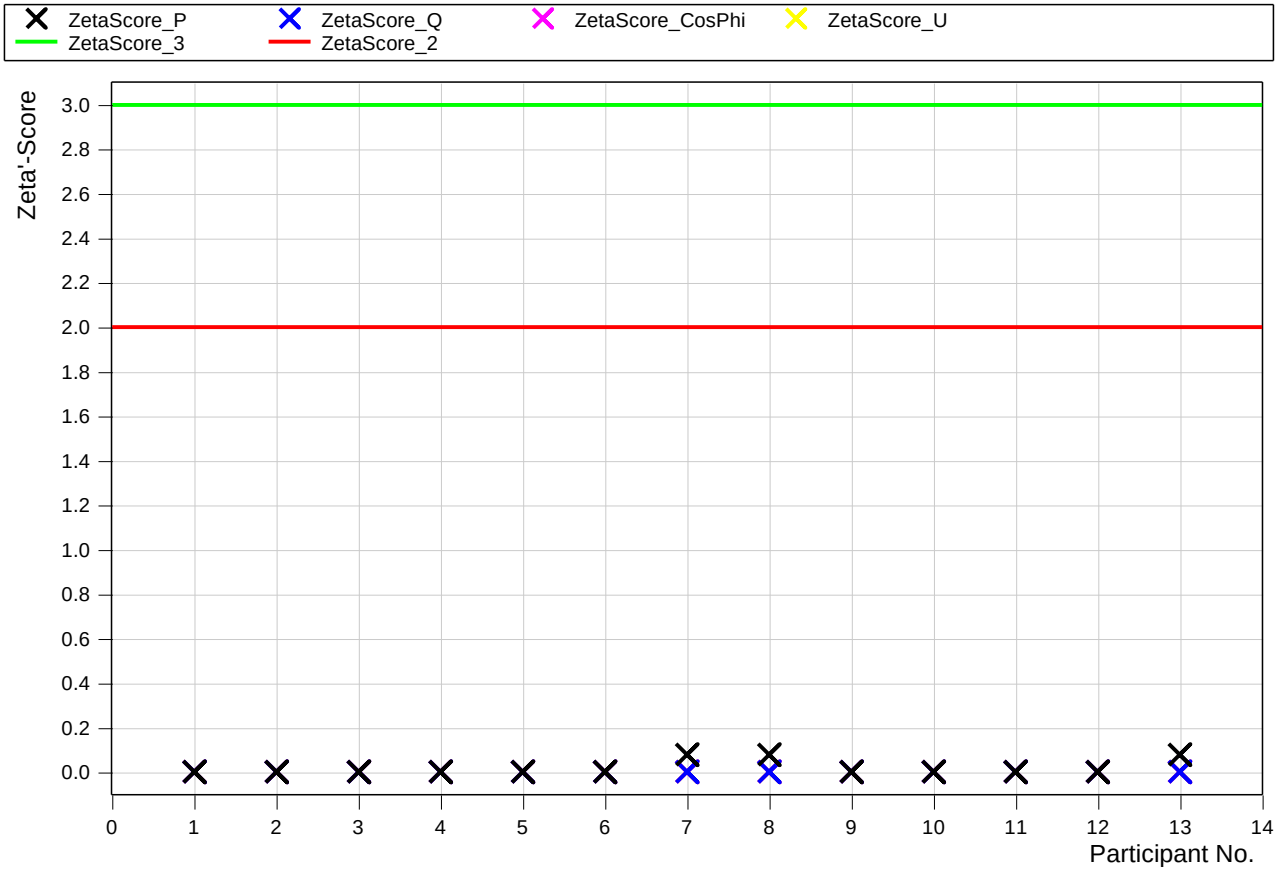
Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3.

The following table shows the delivered results of the participants and the corresponding statistics. In this task no participant is located in the red level. No participant is located in the yellow level.

| Participant | | Various quantities | | | | Bin Assignment OK |
|---|---|---|---|---|---|---|
| No. | ID | P [kW] | Q [kvar] | Cos ϕ | U [V] | |
| 1 | 0581 | 5106 | -16 | 1.000 | 5756 | Yes |
| 2 | 0857 | 5106 | -16 | 1.000 | 5756 | Yes |
| 3 | 1136 | 5106 | -16 | 1.000 | 5756 | Yes |
| 4 | 2033 | 5106 | -16 | 1.000 | 5756 | Yes |
| 5 | 2546 | 5106 | -16 | 1.000 | 5756 | Yes |
| 6 | 3866 | 5106 | -16 | 1.000 | 5756 | Yes |
| 7 | 4515 | 5105 | -16 | 1.000 | 5756 | Yes |
| 8 | 4803 | 5105 | -16 | 1.000 | 5756 | Yes |
| 9 | 6432 | 5106 | -16 | 1.000 | 5756 | Yes |
| 10 | 6805 | 5106 | -16 | 1.000 | 5756 | Yes |
| 11 | 8373 | 5106 | -16 | 1.000 | 5756 | Yes |
| 12 | 8418 | 5106 | -16 | 1.000 | 5756 | Yes |
| 13 | 8819 | 5105 | -16 | 1.000 | 5756 | Yes |
| Statistics (all participants) | Median | 5106 | -16 | 1.000 | 5756 | -- |
| | Min | 5105 | -16 | 1.000 | 5756 | -- |
| | Max | 5106 | -16 | 1.000 | 5756 | -- |
| | Standard Deviation | 0.42 | 0.00 | 0.000 | 0.00 | -- |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.42 | 0.00 | 0.000 | 0.00 | -- |
| | $\sigma_d$ | 0.707 | 0.707 | 0.0007 | 0.707 | -- |
| | $\sigma_p$ | 12.77 | -0.04 | 0.003 | 14.39 | -- |

The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score - Various quantities | | | | Bin Assignment OK | Level of compliance (overall task 8) |
|---|---|---|---|---|---|---|---|
| No. | ID | P | Q | Cos ϕ | U | | |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 7 | 4515 | 0.08 | 0.00 | 0.00 | 0.00 | Yes | |
| 8 | 4803 | 0.08 | 0.00 | 0.00 | 0.00 | Yes | |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | Yes | |
| 13 | 8819 | 0.08 | 0.00 | 0.00 | 0.00 | Yes | |



## 6.9. Task 9 – Undervoltage events

Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3.

The following table shows the delivered results of the participants and the corresponding statistics. Four participants are located in the red level. Two participants are located in the yellow level.

| Participant | | Parameter (Various quantities) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 5 [-] | 6 [-] | 11 [ms] | 12 [p.u.] | 13 [p.u]. | 15 [p.u.] | 16 [p.u.] | 17 [p.u.] |
| 1 | 0581 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 2 | 0857 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 3 | 1136 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 4 | 2033 | FL | 3 | 1.000 | 0.27 | 0.00 | 1.00 | 0.99 | -0.06 |
| 5 | 2546 | FL | 3 | 1.003 | 1.00 | 0.00 | 1.00 | 1.00 | -0.05 |
| 6 | 3866 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 7 | 4515 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 8 | 4803 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 9 | 6432 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 10 | 6805 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 11 | 8373 | FL | 3 | 1.016 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 12 | 8418 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| 13 | 8819 | FL | 3 | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| Statistics (all participants) | Assigned value | -- | -- | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| | Min | -- | -- | 1.000 | 0.27 | 0.00 | 0.98 | 0.99 | -0.06 |
| | Max | -- | -- | 1.016 | 1.00 | 0.00 | 1.00 | 1.00 | -0.05 |
| | Standard Deviation | -- | -- | 0.004 | 0.192 | 0.000 | 0.007 | 0.003 | 0.003 |
| Statistics (successful participants) | Assigned value | -- | -- | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| | Min | -- | -- | 1.001 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| | Max | -- | -- | 1.016 | 0.28 | 0.00 | 0.98 | 0.99 | -0.06 |
| | Standard Deviation | -- | -- | 0.005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | -- | -- | 0.004 | 0.192 | 0.000 | 0.007 | 0.003 | 0.003 |
| | $\sigma_d$ | -- | -- | 0.0007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | -- | -- | 0 | 0 | 0 | 0 | 0 | 0 |

| Participant | | Parameter (Various quantities) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 18 [p.u.] | 19 [p.u.] | 20 [p.u.] | 21 [p.u.] | 22 [p.u.] | 23 [p.u.] | 24 [p.u.] | 25 [s] | 26 [s] |
| 1 | 0581 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 2 | 0857 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.014 | 0.029 |
| 3 | 1136 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 4 | 2033 | 0.99 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.000 | 0.036 |
| 5 | 2546 | 0.99 | -0.05 | 0.27 | 0.19 | 0.26 | 0.69 | 0.97 | 0.025 | 0.034 |
| 6 | 3866 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 7 | 4515 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 8 | 4803 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 9 | 6432 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 10 | 6805 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 11 | 8373 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| 12 | 8418 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.001 | 0.018 |
| 13 | 8819 | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| Statistics (all participants) | Assigned value | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| | Min | 0.99 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.000 | 0.018 |
| | Max | 1.01 | -0.05 | 0.27 | 0.19 | 0.26 | 0.69 | 0.97 | 0.025 | 0.036 |
| | Standard Deviation | 0.007 | 0.003 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.006 | 0.004 |
| Statistics (successful participants) | Assigned value | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| | Min | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.013 | 0.029 |
| | Max | 1.01 | -0.06 | 0.27 | 0.19 | 0.26 | 0.68 | 0.97 | 0.014 | 0.029 |
| | Standard Deviation | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.007 | 0.003 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.006 | 0.004 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Participant | | Parameter (Various quantities) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 27 [s] | 28 [s] | 29 [p.u.] | 30 [p.u.] | 31 [p.u.] | 32 [p.u.] | 33 [p.u.] | 34 [s] | 35 [s] |
| 1 | 0581 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| 2 | 0857 | 0.046 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.087 | 0.031 |
| 3 | 1136 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| 4 | 2033 | 0.039 | 0.002 | 1.00 | 0.99 | -0.06 | 0.99 | -0.07 | 0.093 | 0.036 |
| 5 | 2546 | 0.025 | 0.032 | 1.00 | 1.00 | -0.05 | 1.00 | -0.05 | 0.071 | 0.051 |
| 6 | 3866 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| 7 | 4515 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | 0.08 | 0.091 | 0.033 |
| 8 | 4803 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| 9 | 6432 | 0.046 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| 10 | 6805 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| 11 | 8373 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.096 | 0.032 |
| 12 | 8418 | 0.037 | 0.018 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.079 | 0.022 |
| 13 | 8819 | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| Statistics (all participants) | Assigned value | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| | Min | 0.025 | 0.002 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.071 | 0.022 |
| | Max | 0.049 | 0.032 | 1.00 | 1.00 | -0.05 | 1.00 | 0.08 | 0.096 | 0.051 |
| | Standard Deviation | 0.007 | 0.008 | 0.000 | 0.003 | 0.009 | 0.003 | 0.043 | 0.006 | 0.006 |
| Statistics (successful participants) | Assigned value | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.091 | 0.033 |
| | Min | 0.046 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.087 | 0.031 |
| | Max | 0.049 | 0.029 | 1.00 | 0.99 | -0.08 | 0.99 | -0.08 | 0.096 | 0.033 |
| | Standard Deviation | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.001 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.007 | 0.008 | 0.000 | 0.003 | 0.009 | 0.003 | 0.043 | 0.006 | 0.006 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Participant | | Parameter (Various quantities) | | |
|---|---|---|---|---|
| No. | ID | 36 [s] | 37 [s] | 38 [s] |
| 1 | 0581 | 0.152 | 5.144 | 0.088 |
| 2 | 0857 | 0.087 | 5.144 | 0.093 |
| 3 | 1136 | 0.152 | 5.144 | 0.085 |
| 4 | 2033 | 0.119 | 0.040 | 0.086 |
| 5 | 2546 | 0.073 | 0.107 | 0.123 |
| 6 | 3866 | 0.152 | 5.144 | 0.072 |
| 7 | 4515 | 0.152 | 5.144 | 0.085 |
| 8 | 4803 | 0.152 | 5.144 | 0.072 |
| 9 | 6432 | 0.151 | 5.142 | 0.086 |
| 10 | 6805 | 0.152 | 5.144 | 0.085 |
| 11 | 8373 | 0.096 | 5.145 | 0.102 |
| 12 | 8418 | 0.140 | 5.135 | 0.072 |
| 13 | 8819 | 0.152 | 5.144 | 0.086 |
| Statistics (all participants) | Assigned value | 0.152 | 5.144 | 0.086 |
| | Min | 0.073 | 0.040 | 0.072 |
| | Max | 0.152 | 5.145 | 0.123 |
| | Standard Deviation | 0.028 | 1.829 | 0.013 |
| Statistics (successful participants) | Assigned value | 0.152 | 5.144 | 0.086 |
| | Min | 0.087 | 5.142 | 0.072 |
| | Max | 0.152 | 5.145 | 0.102 |
| | Standard Deviation | 0.026 | 0.001 | 0.009 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.028 | 0.003 | 0.013 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0 | 0 | 0 |

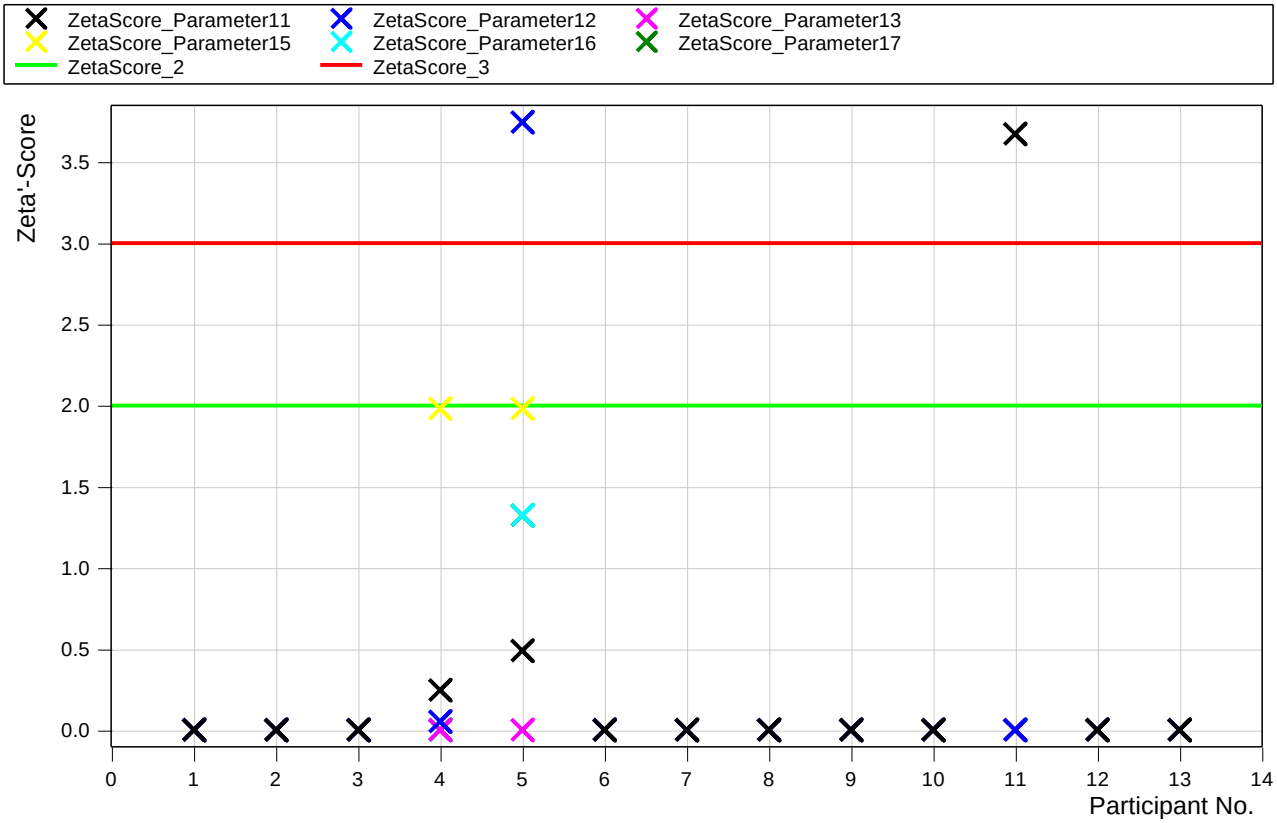
The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score – Undervoltage events (Parameter No.) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 11 | 12 | 13 | 15 | 16 | 17 | 18 | 19 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.24 | 0.05 | 0.00 | 1.98 | 0.00 | 0.00 | 1.98 | 0.00 |
| 5 | 2546 | 0.49 | 3.75 | 0.00 | 1.98 | 1.32 | 1.32 | 1.98 | 1.32 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 3.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Undervoltage events (Parameter No.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.43 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.20 | 1.78 | 1.43 | 3.51 |
| 5 | 2546 | 0.00 | 0.00 | 0.00 | 1.32 | 0.00 | 2.03 | 1.27 | 3.43 | 0.39 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.03 | 2.79 | 1.71 | 1.43 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Undervoltage events (Parameter No.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.63 | 0.34 | 2.32 | 0.00 | 0.53 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 4 | 2033 | 0.00 | 0.00 | 1.72 | 0.00 | 0.23 | 0.31 | 0.50 | 1.18 | 1865 | 0.00 |
| 5 | 2546 | 0.00 | 1.32 | 2.58 | 1.32 | 0.70 | 3.13 | 3.02 | 2.82 | 1840 | 2.81 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.06 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 3.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.06 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.73 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.78 | 0.17 | 2.00 | 0.37 | 1.22 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.88 | 1.85 | 0.43 | 3.29 | 1.06 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Undervoltage events |
|---|---|---|
| No. | ID | Level of compliance (overall task 9) |
| 1 | 0581 | |
| 2 | 0857 | |
| 3 | 1136 | |
| 4 | 2033 | |
| 5 | 2546 | |
| 6 | 3866 | |
| 7 | 4515 | |
| 8 | 4803 | |
| 9 | 6432 | |
| 10 | 6805 | |
| 11 | 8373 | |
| 12 | 8418 | |
| 13 | 8819 | |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ZetaScore_Parameter13
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ZetaScore_Parameter17
ZetaScore_2
ZetaScore_3
Zeta'-Score
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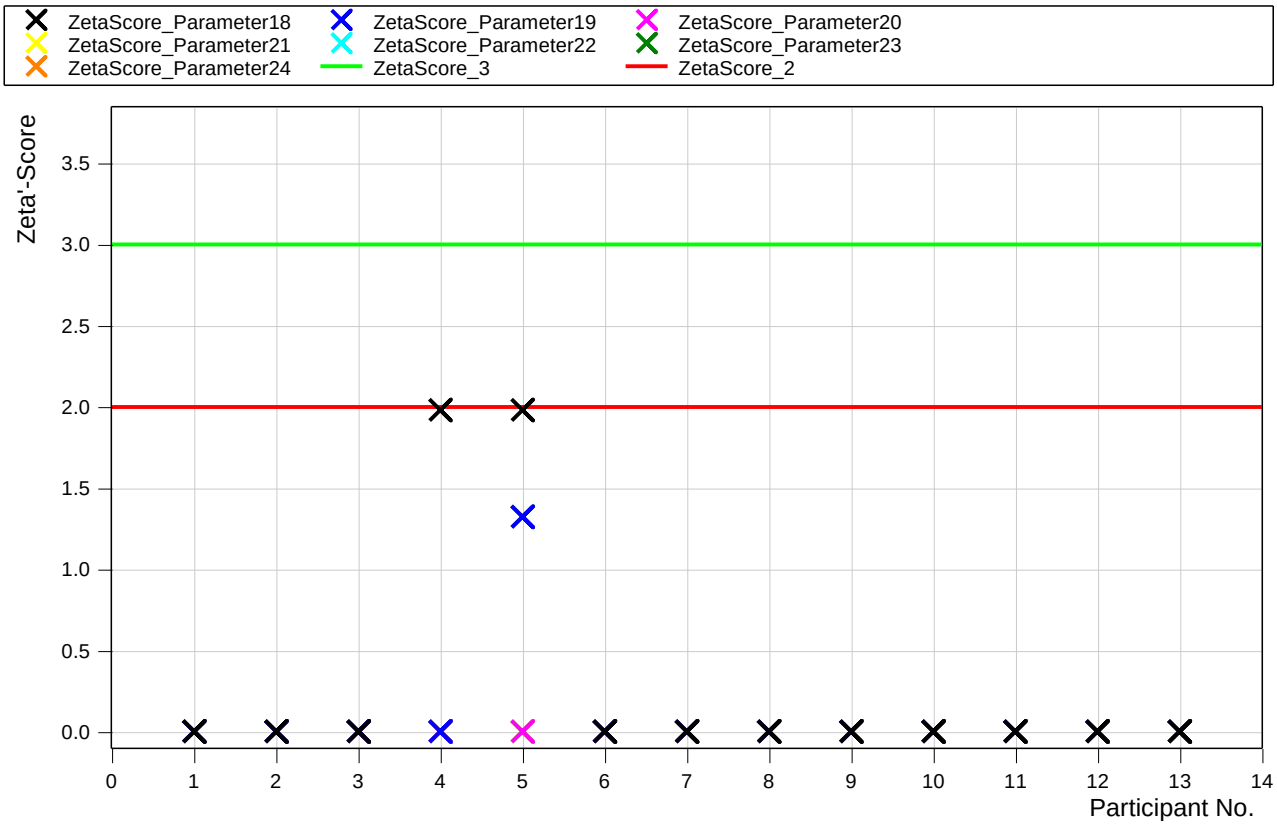
13
14
Participant No.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ZetaScore_Parameter21
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ZetaScore_Parameter23
ZetaScore_Parameter24
ZetaScore_3
ZetaScore_2
Zeta'-Score
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9
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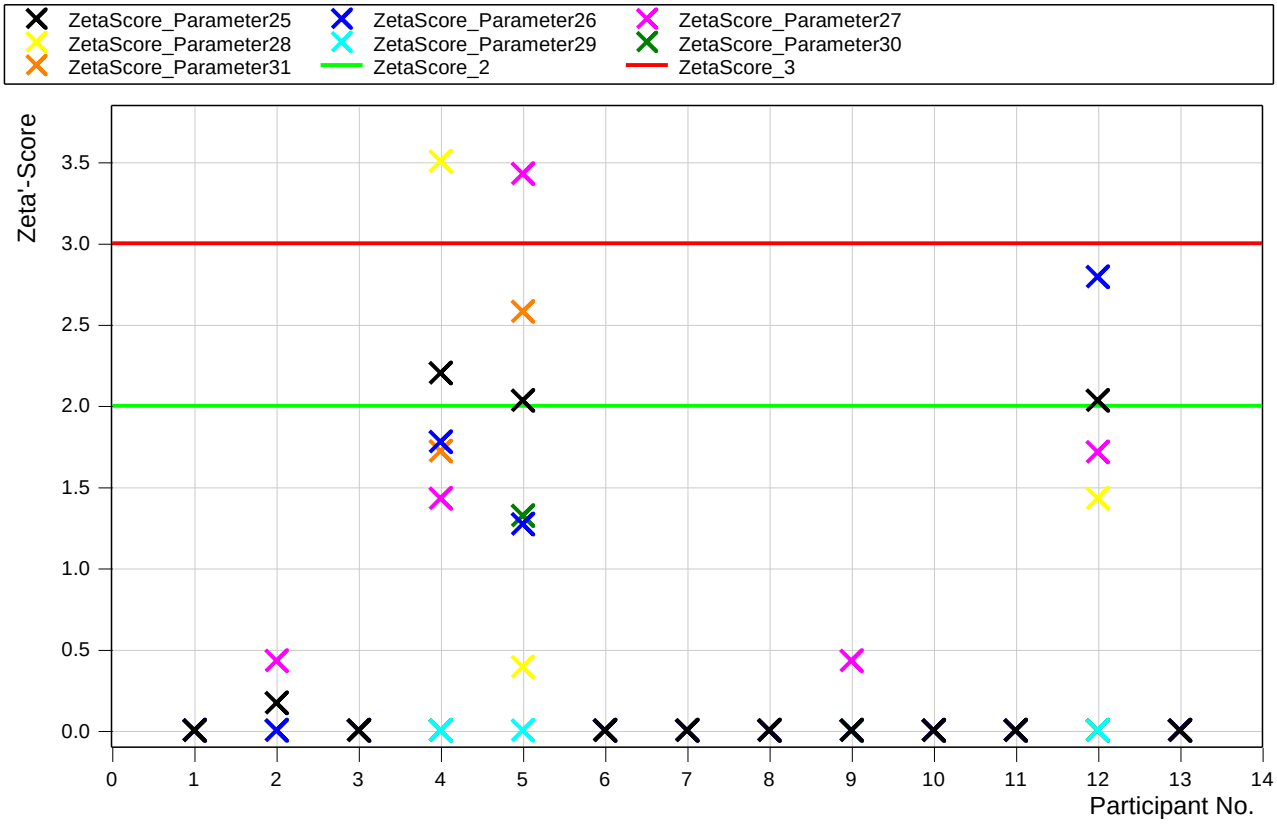
11
12
13
14
Participant No.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ZetaScore_Parameter26
ZetaScore_Parameter27
ZetaScore_Parameter28
ZetaScore_Parameter29
ZetaScore_Parameter30
ZetaScore_Parameter31
ZetaScore_2
ZetaScore_3
Zeta'-Score
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2.5
2.0
1.5
1.0
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5
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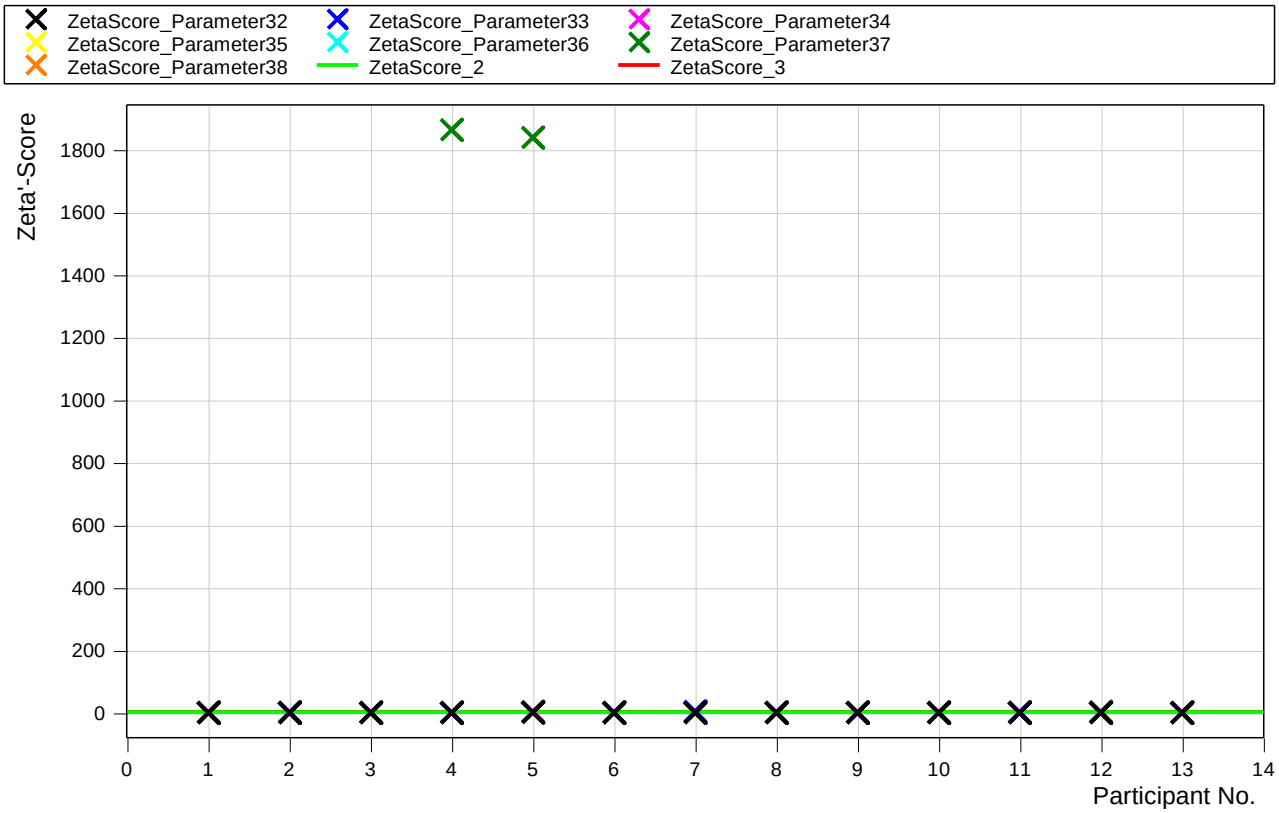
7
8
9
10
11
12
13
14
Participant No.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ZetaScore_Parameter33
ZetaScore_Parameter34
ZetaScore_Parameter35
ZetaScore_Parameter36
ZetaScore_Parameter37
ZetaScore_Parameter38
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Zeta'-Score
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800
600
400
200
0
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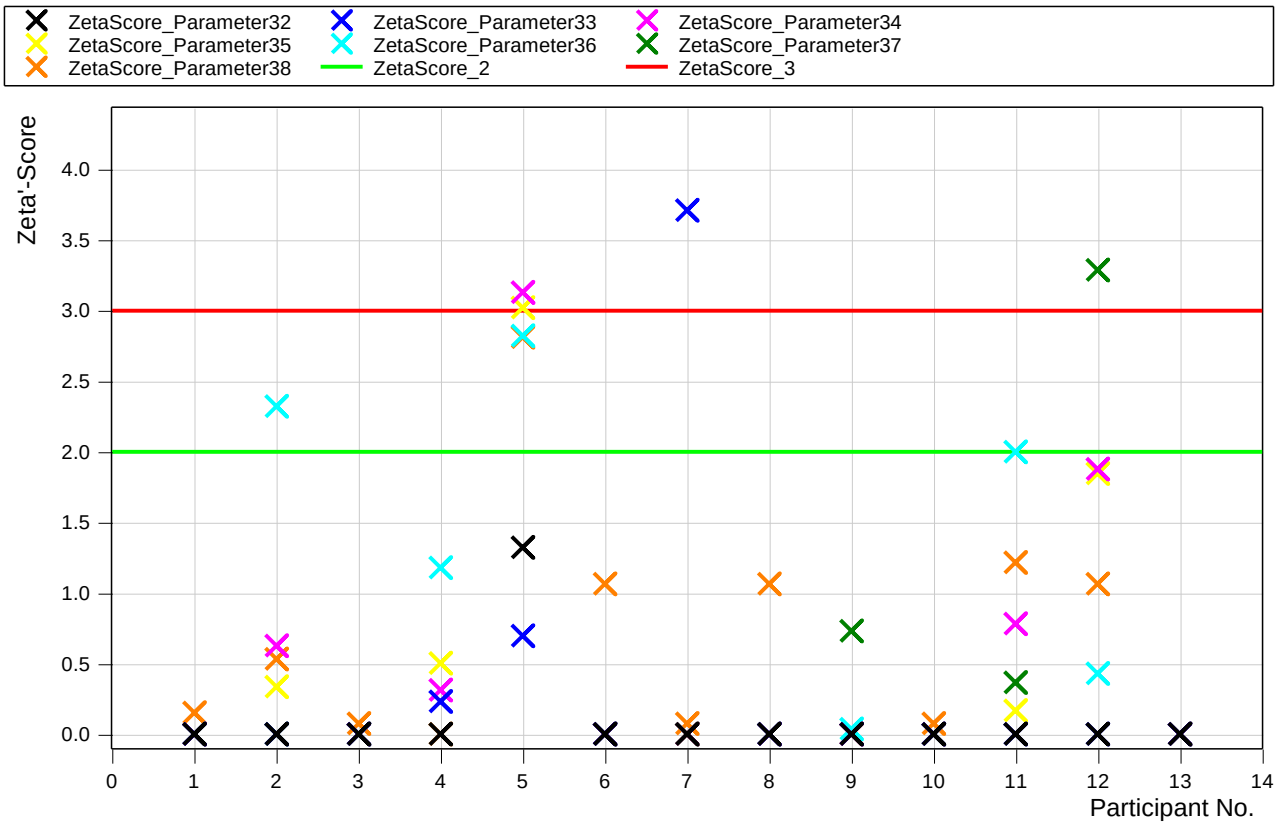
6
7
8
9
10
11
12
13
14
Participant No.

Zoom of above graph without 2 maximum values:



## 6.10. Task 10 – Overvoltage events

Pass/Fail Criteria: with Zeta' Score statistics according to Chapter 3.

The following table shows the delivered results of the participants and the corresponding statistics. Three participants are located in the red level. One participant is located in the yellow level.

| Participant | | Parameter (Various quantities) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 5 [-] | 6 [-] | 11 [ms] | 12 [p.u.] | 13 [p.u]. | 15 [p.u.] | 16 [p.u.] | 17 [p.u.] |
| 1 | 0581 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 2 | 0857 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 3 | 1136 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 4 | 2033 | FL | 2 | 5.000 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 5 | 2546 | FL | 2 | 5.003 | 1.11 | 0.10 | 1.01 | 1.00 | 0.02 |
| 6 | 3866 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 7 | 4515 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 8 | 4803 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 9 | 6432 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 10 | 6805 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 11 | 8373 | FL | 2 | 4.978 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 12 | 8418 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| 13 | 8819 | FL | 2 | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| Statistics (all participants) | Assigned value | -- | -- | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| | Min | -- | -- | 4.978 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| | Max | -- | -- | 5.003 | 1.11 | 0.10 | 1.01 | 1.00 | 0.02 |
| | Standard Deviation | -- | -- | 0.006 | 0.000 | 0.000 | 0.003 | 0.003 | 0.000 |
| Statistics (successful participants) | Assigned value | -- | -- | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| | Min | -- | -- | 4.978 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| | Max | -- | -- | 4.997 | 1.11 | 0.10 | 1.00 | 0.99 | 0.02 |
| | Standard Deviation | -- | -- | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | -- | -- | 0.006 | 0.000 | 0.000 | 0.003 | 0.003 | 0.000 |
| | $\sigma_d$ | -- | -- | 0.0007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 |
| | $\sigma_p$ | -- | -- | 0 | 0 | 0 | 0 | 0 | 0 |

| Participant | | Parameter (Various quantities) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 18 [p.u.] | 19 [p.u.] | 20 [p.u.] | 21 [p.u.] | 22 [p.u.] | 23 [p.u.] | 24 [p.u.] | 25 [s] | 26 [s] |
| 1 | 0581 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| 2 | 0857 | 1.00 | 0.02 | 1.11 | 1.00 | -0.20 | 0.90 | -0.18 | 0.002 | 0.000 |
| 3 | 1136 | 1.00 | 0.02 | 1.11 | 1.00 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| 4 | 2033 | 0.99 | 0.02 | 1.19 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.033 |
| 5 | 2546 | 1.00 | 0.02 | 1.19 | 1.00 | -0.19 | 0.90 | -0.18 | 0.025 | 0.031 |
| 6 | 3866 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| 7 | 4515 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| 8 | 4803 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.000 | 0.032 |
| 9 | 6432 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.000 | 0.032 |
| 10 | 6805 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| 11 | 8373 | 1.00 | 0.02 | 1.11 | 1.00 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| 12 | 8418 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.017 | 0.048 |
| 13 | 8819 | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| Statistics (all participants) | Assigned value | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| | Min | 0.99 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.000 | 0.000 |
| | Max | 1.00 | 0.02 | 1.19 | 1.00 | -0.19 | 0.90 | -0.18 | 0.025 | 0.048 |
| | Standard Deviation | 0.003 | 0.000 | 0.029 | 0.005 | 0.003 | 0.000 | 0.000 | 0.007 | 0.010 |
| Statistics (successful participants) | Assigned value | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.001 | 0.032 |
| | Min | 1.00 | 0.02 | 1.11 | 0.99 | -0.20 | 0.90 | -0.18 | 0.000 | 0.032 |
| | Max | 1.00 | 0.02 | 1.11 | 1.00 | -0.20 | 0.90 | -0.18 | 0.017 | 0.048 |
| | Standard Deviation | 0.000 | 0.000 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 | 0.005 | 0.005 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.003 | 0.000 | 0.029 | 0.005 | 0.003 | 0.000 | 0.000 | 0.007 | 0.010 |
| | $\sigma_d$ | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Participant | | Parameter (Various quantities) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 27 [s] | 28 [s] | 29 [p.u.] | 30 [p.u.] | 31 [p.u.] | 32 [p.u.] | 33 [p.u.] | 34 [s] | 35 [s] |
| 1 | 0581 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| 2 | 0857 | 0.002 | 0.033 | 1.00 | 1.00 | 0.02 | 1.00 | 0.02 | 0.000 | 0.014 |
| 3 | 1136 | 0.001 | 0.032 | 1.00 | 1.00 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| 4 | 2033 | 0.015 | 0.053 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.000 | 0.037 |
| 5 | 2546 | 0.050 | 0.058 | 1.01 | 1.00 | 0.01 | 0.98 | 0.01 | 0.016 | 0.018 |
| 6 | 3866 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| 7 | 4515 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| 8 | 4803 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.000 | 0.015 |
| 9 | 6432 | 0.000 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| 10 | 6805 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| 11 | 8373 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.000 | 0.015 |
| 12 | 8418 | 0.017 | 0.048 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.014 | 0.028 |
| 13 | 8819 | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| Statistics (all participants) | Assigned value | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| | Min | 0.000 | 0.032 | 1.00 | 0.99 | 0.01 | 0.98 | 0.01 | 0.000 | 0.014 |
| | Max | 0.050 | 0.058 | 1.01 | 1.00 | 0.02 | 1.00 | 0.02 | 0.016 | 0.037 |
| | Standard Deviation | 0.014 | 0.009 | 0.003 | 0.004 | 0.003 | 0.005 | 0.003 | 0.005 | 0.007 |
| Statistics (successful participants) | Assigned value | 0.001 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.001 | 0.015 |
| | Min | 0.000 | 0.032 | 1.00 | 0.99 | 0.02 | 1.00 | 0.02 | 0.000 | 0.015 |
| | Max | 0.017 | 0.048 | 1.00 | 1.00 | 0.02 | 1.00 | 0.02 | 0.014 | 0.028 |
| | Standard Deviation | 0.005 | 0.005 | 0.000 | 0.003 | 0.000 | 0.000 | 0.000 | 0.004 | 0.004 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.014 | 0.009 | 0.003 | 0.004 | 0.003 | 0.005 | 0.003 | 0.005 | 0.007 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Participant | | Parameter (Various quantities) | | |
|---|---|---|---|---|
| No. | ID | 36 [s] | 37 [s] | 38 [s] |
| 1 | 0581 | 0.001 | 0.015 | 0.000 |
| 2 | 0857 | 0.000 | 0.014 | 0.000 |
| 3 | 1136 | 0.001 | 0.015 | 0.000 |
| 4 | 2033 | 0.040 | 0.040 | 0.003 |
| 5 | 2546 | 0.016 | 0.012 | 0.059 |
| 6 | 3866 | 0.001 | 0.015 | 0.000 |
| 7 | 4515 | 0.001 | 0.015 | 0.000 |
| 8 | 4803 | 0.001 | 0.015 | 0.000 |
| 9 | 6432 | 0.009 | 0.015 | 0.000 |
| 10 | 6805 | 0.001 | 0.015 | 0.000 |
| 11 | 8373 | 0.000 | 0.015 | 0.000 |
| 12 | 8418 | 0.014 | 0.028 | 0.000 |
| 13 | 8819 | 0.001 | 0.015 | 0.000 |
| Statistics (all participants) | Assigned value | 0.001 | 0.015 | 0.000 |
| | Min | 0.000 | 0.012 | 0.000 |
| | Max | 0.040 | 0.040 | 0.059 |
| | Standard Deviation | 0.011 | 0.007 | 0.016 |
| Statistics (successful participants) | Assigned value | 0.001 | 0.015 | 0.000 |
| | Min | 0.000 | 0.015 | 0.000 |
| | Max | 0.014 | 0.028 | 0.000 |
| | Standard Deviation | 0.004 | 0.004 | 0.000 |
| Parameter for Zeta' Score statistic | $\sigma_R$ | 0.011 | 0.004 | 0.016 |
| | $\sigma_d$ | 0.0007 | 0.0007 | 0.0007 |
| | $\sigma_p$ | 0 | 0 | 0 |

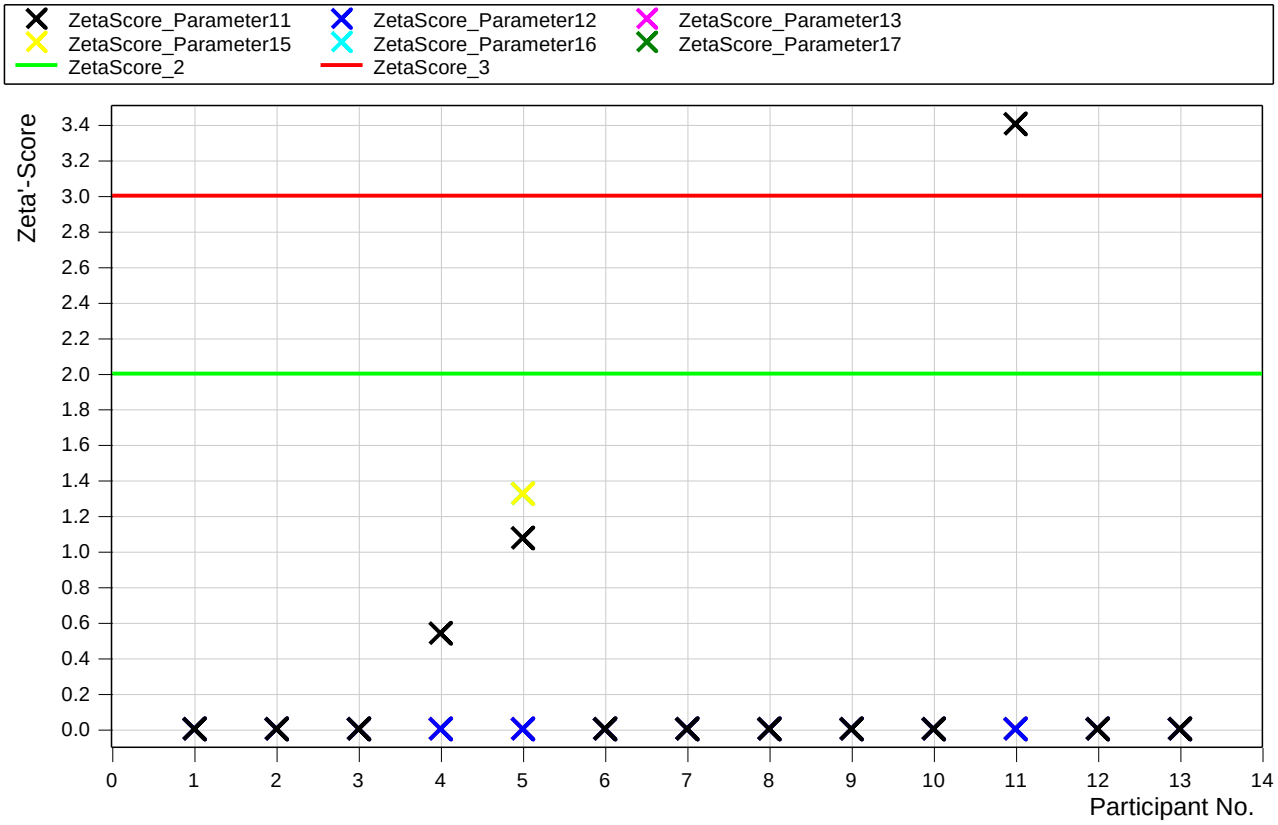
The following tables and figures show the results of the Zeta' Score calculation.

| Participant | | Zeta' Score – Overvoltage events (Parameter No.) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 11 | 12 | 13 | 15 | 16 | 17 | 18 | 19 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 1136 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 | 0.00 |
| 5 | 2546 | 1.08 | 0.00 | 0.00 | 1.32 | 1.32 | 0.00 | 0.00 | 0.00 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 3.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Overvoltage events (Parameter No.) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.13 | 3.24 | 0.07 | 0.11 |
| 3 | 1136 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 2.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 1.03 | 2.32 |
| 5 | 2546 | 2.69 | 1.18 | 1.32 | 0.00 | 0.00 | 3.21 | 0.10 | 3.62 | 2.87 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.07 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.14 | 1.62 | 1.18 | 1.77 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Overvoltage events (Parameter No.) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 1 | 0581 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0857 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.19 | 0.15 | 0.09 | 0.13 | 0.00 |
| 3 | 1136 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 2033 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 3.34 | 3.54 | 3.36 | 0.19 |
| 5 | 2546 | 1.32 | 1.21 | 1.32 | 2.26 | 1.32 | 2.85 | 0.46 | 1.36 | 0.40 | 3.76 |
| 6 | 3866 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | 4515 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | 4803 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 6432 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.73 | 0.00 | 0.00 |
| 10 | 6805 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11 | 8373 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.09 | 0.00 | 0.00 |
| 12 | 8418 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.47 | 1.97 | 1.18 | 1.74 | 0.00 |
| 13 | 8819 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Participant | | Zeta' Score - Overvoltage events |
|---|---|---|
| No. | ID | Level of compliance (overall task 10) |
| 1 | 0581 | |
| 2 | 0857 | |
| 3 | 1136 | |
| 4 | 2033 | |
| 5 | 2546 | |
| 6 | 3866 | |
| 7 | 4515 | |
| 8 | 4803 | |
| 9 | 6432 | |
| 10 | 6805 | |
| 11 | 8373 | |
| 12 | 8418 | |
| 13 | 8819 | |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ZetaScore_Parameter12
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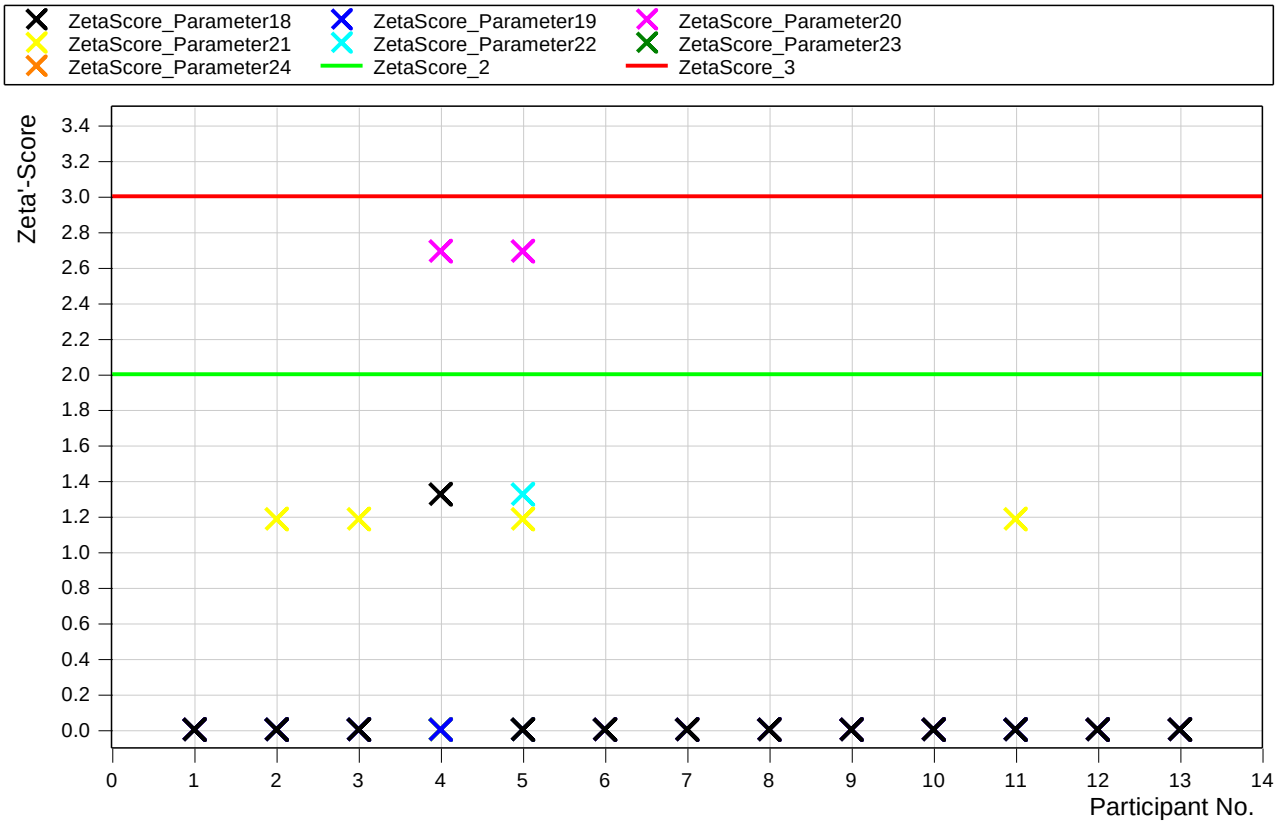
ZetaScore_Parameter15
ZetaScore_Parameter16
ZetaScore_Parameter17
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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ZetaScore_Parameter19
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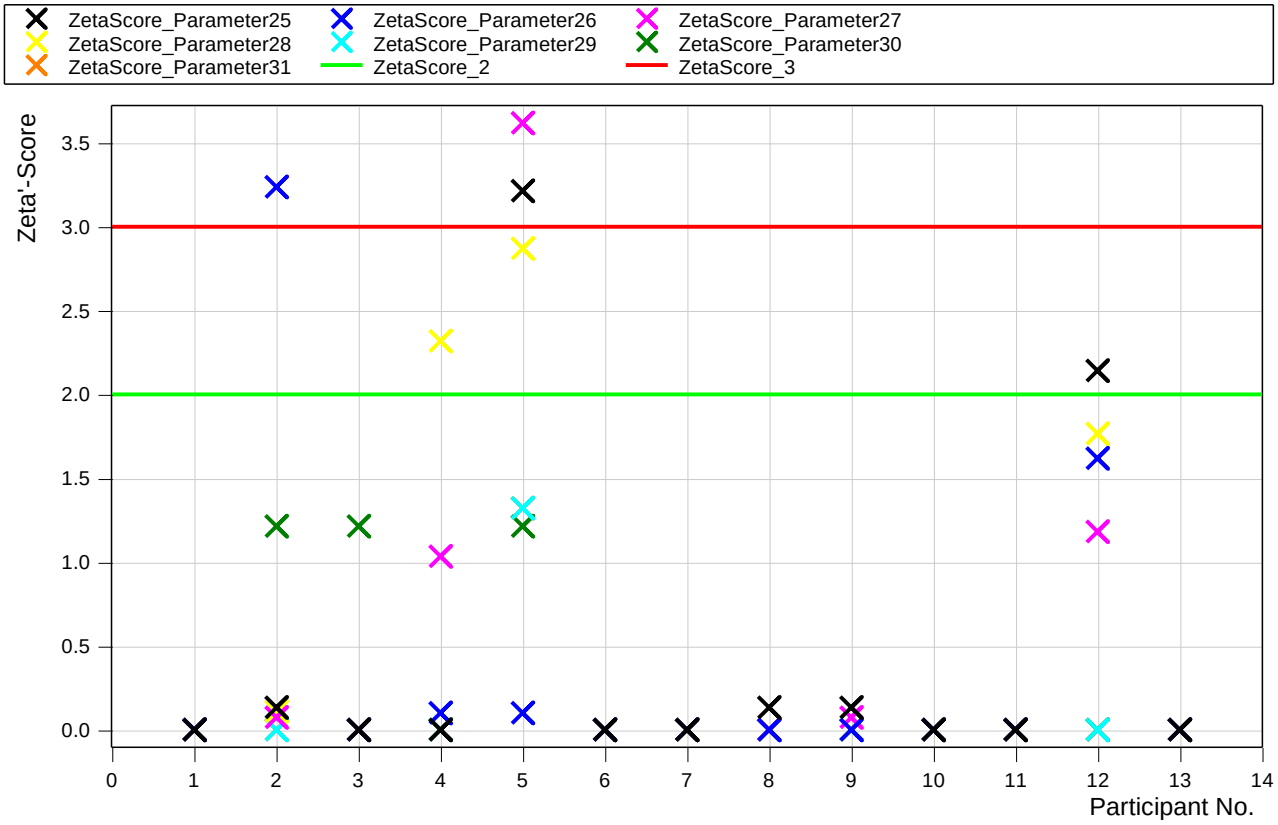
ZetaScore_Parameter22
ZetaScore_Parameter23
ZetaScore_Parameter24
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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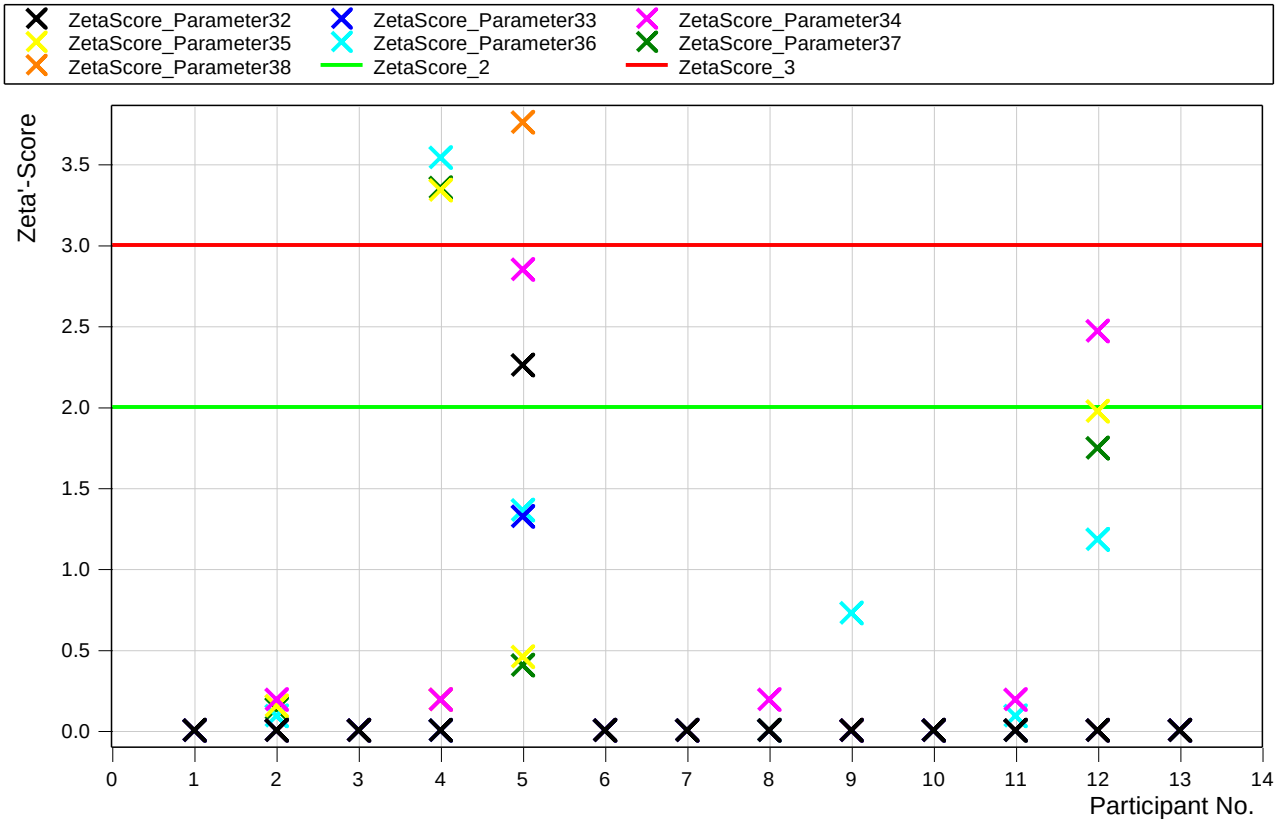
ZetaScore_Parameter31
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.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ZetaScore_Parameter33
ZetaScore_Parameter34
ZetaScore_Parameter35
ZetaScore_Parameter36
ZetaScore_Parameter37
ZetaScore_Parameter38
ZetaScore_2
ZetaScore_3
Zeta'-Score
Participant No.

## 6.11. Proficiency Test Result (overview)

The level of compliance for each task and the Pass / Fail Criteria for the complete Proficiency Test was determined according to Chapter 3. The following table shows the level of compliance for each task and the pass / fail information for the entire PT for each participant. Task 2 is optional. Participants who did not deliver data for this task are shown in white.

| Participant | | Task | | | | | | | | | | | | | | | | Pass / Fail (entire PT) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | ID | 1 | 2 (opt) | 3 | 4 kf | 4 ku | 5.1 | 5.2 | 5.3 | 6.1 | 6.2 | 6.3 | 7 kW | 7 p.u. | 8 | 9 | 10 | |
| 1 | 0581 | | | | | | | | | | | | | | | | | Pass |
| 2 | 0857 | | | | | | | | | | | | | | | | | Fail |
| 3 | 1136 | | | | | | | | | | | | | | | | | Fail |
| 4 | 2033 | | | | | | | | | | | | | | | | | Fail |
| 5 | 2546 | | | | | | | | | | | | | | | | | Fail |
| 6 | 3866 | | | | | | | | | | | | | | | | | Pass |
| 7 | 4515 | | | | | | | | | | | | | | | | | Fail |
| 8 | 4803 | | | | | | | | | | | | | | | | | Pass |
| 9 | 6432 | | | | | | | | | | | | | | | | | Fail |
| 10 | 6805 | | | | | | | | | | | | | | | | | Pass |
| 11 | 8373 | | | | | | | | | | | | | | | | | Fail |
| 12 | 8418 | | | | | | | | | | | | | | | | | Fail |
| 13 | 8819 | | | | | | | | | | | | | | | | | Pass |

# 7. IECRE participants that have passed the Proficiency Test

The following participants (in alphabetical order) are either **IECRE RETLs or RETL candidates** and have **passed** the Proficiency Test, either directly or after a successful participation in a correction plan phase:

| **TESTING LABORATORY** |
|---|
| Barlovento Applus+ |
| China Electric Power Research Institute - CEPRI |
| DNV Energy Systems Germany GmbH |
| DNV Maritime and Energy, S.L.U. |
| Shanghai SERCAL New Energy Technology Co., Ltd. |
| UL International GmbH |
| WIND-consult GmbH |
| WindGuard Certification GmbH |
| windtest grevenbroich gmbh |

**Note:** This list **only contains the IECRE members (or in process of becoming so)** that have **passed** the Proficiency Test.

**The list reflects both the laboratories that have passed the second round of the Proficiency Test and those that have successfully completed the Correction Plan Phase.** In order to improve the result analysis, tables in section 6 show the results of Round 2 **before** the correction plan phase. Thus, the number of successful participants does not match between section 6 and this table.

# 8. Conclusions and recommendations after each Round

## 8.1. Conclusions after Round 1.

As conclusion after Round 1, the following alignments were taken into account for Round 2:

- Extension of standard uncertainty by additional parameter (digit uncertainty and additional error limit) for the Z-Score calculation (compare Chapter 3) to improve reliability of Z-Score results.
- Creation of Clarification Sheet "20ec01 CS#1" to improve the common understanding of FRT parameter evaluation (Task 9 and Task 10).
- Detailed information to be given in the instruction regarding evaluation periods in order to ensure comparability of results (such as pre-defined times for $t_{fault}$ and $t_{clear}$ in task 9 and 10).

## 8.2. Conclusions after Round 2.

After Round 2 it is noticeable that a significant number of participants have failed one or more tasks of the Proficiency Test.

This is a result that can be expected after a very thorough Proficiency Test in which many aspects of the standard have been evaluated. However, some further explanations can be found that explain the number of deviations:

- The Zeta Score-based pass and fail criteria, which were agreed in the EC group, leads sometimes to to very tight tolerances. These tolerances might give yellow or red flags for small deviations from the median results, even though such deviation might not be critical from technical perspective. This effect happens when many participants give the same exact result, leading to a very low standard deviation. This fact will be taken into account for next editions of the Proficiency Tests.
- In the case of task 5.3 (in which 4 participants failed), the most probable cause for the problem is a lack of compatibility between the database provided to the participants and a specific brand of commercial software. The sampling frequency of the data sets was 20kHz, according to the minimum sampling frequency required within the IEC, but this software seems to require a higher sampling frequency for higher frequency harmonics because additional filters are applied within the software. In day-to-day use the combination of the software together with its associated hardware and the correct sampling frequency is expected to work properly.
- For tasks 9 and 10, the Conductor of the PT suspects that the problem might be caused by some participants' software inability to accept synthetic data. Participants were given the

exact times for the switching moments (T1 and T2), to be able to compare results. In this situation the fault duration (parameter 11) should be the same for all participants, but it was not (one possible cause might be that the participant's software doesn't allow to insert these values manually.) As all other values in the task depend very much on this T1 and T2 for the averaging within the relevant time periods, this could originate a cascading failure effect that hampers all the task's results.

The MEASNET organization will use these conclusions to improve the development of future exercises, in its constant effort to create Proficiency Tests that reflect the quality of the participants as accurately as possible.

It is very important to remark that the IECRE laboratories that have failed one or more tasks in the Proficiency Test have had the chance to undergo a corrective action phase supervised by the IECRE Lead Assessor. This means that the causes for the deviations that have surfaced in this Proficiency Test have been analysed and corrected by the laboratories under the strict surveillance of an independent third party.

# 9. References

[1] IECRE OD-551-17, Edition 1.0, IECRE, 2020-08-17.

[2] IEC 61400-21-1:2019, Measurement and assessment of electrical characteristics – Wind turbines.

[3] ISO/IEC 17043:2010 Conformity assessment – General requirements for proficiency testing.

[4] ISO 13528:2015, corrected version 2016-10-15 - Statistical methods for use in proficiency testing by interlaboratory comparison.

[5] Technical Note – Round Robin Score assessment – Draft edition, July 2021, CRES.

[6] IEC 61000-4-15:2010 Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques - Flickermeter - Functional and design specifications.