

Supplementary Material

November 2, 2021

1 Power Supplies

Photographs of the power supplies mentioned in the paper:

1. HP 0950-4082 with nominal voltage of 32V and maximum current of 940mA in Fig. 1, further termed as power supply 1.
2. DVE DSA-40CA-19 with nominal voltage of 19V and maximum current of 1.58A in Fig. 2, further termed as power supply 2.
3. SAKAL SAW012120100 with nominal voltage of 12V and maximum current of 1000mA in Fig. 3, further termed as power supply 3.



Figure S1: Power supply HP 0950-4082



Figure S2: Power supply DVE DSA-40CA-19



Figure S3: Power supply SAKAL SAW012120100

2 Additional Illustration – Power Supply 1

An additional illustration of signal variability is presented in Fig. 4.

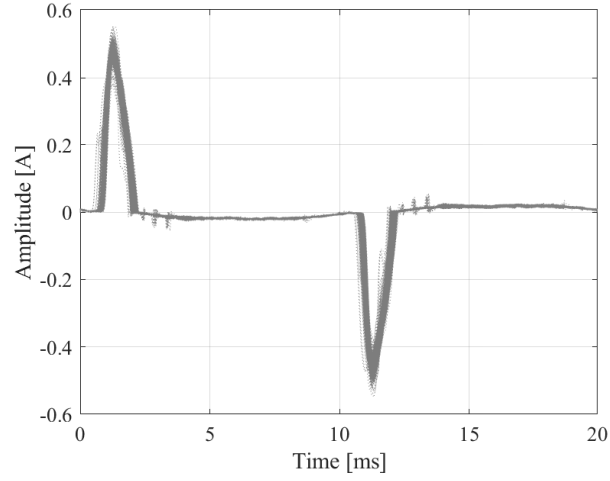


Figure S4: Illustration of the signal variability over multiple time-synchronized periods. Multiple overlapped single periods of the same signal are presented.

3 Additional Illustration – Power Supply 2

This section reproduces Figs. 4, 5, 8, 9, 11 from the paper for power supply 2.

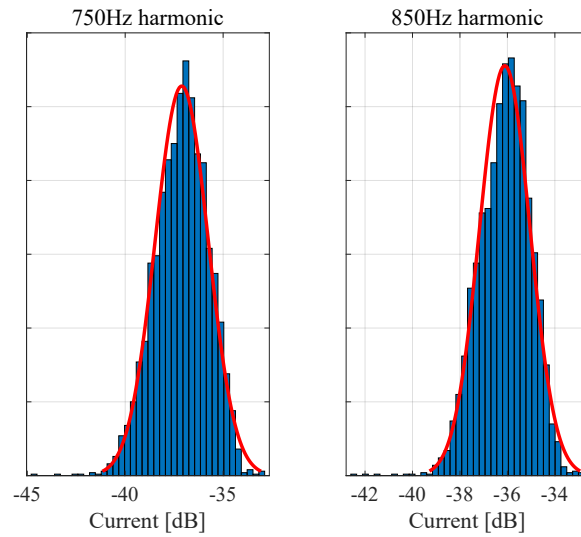
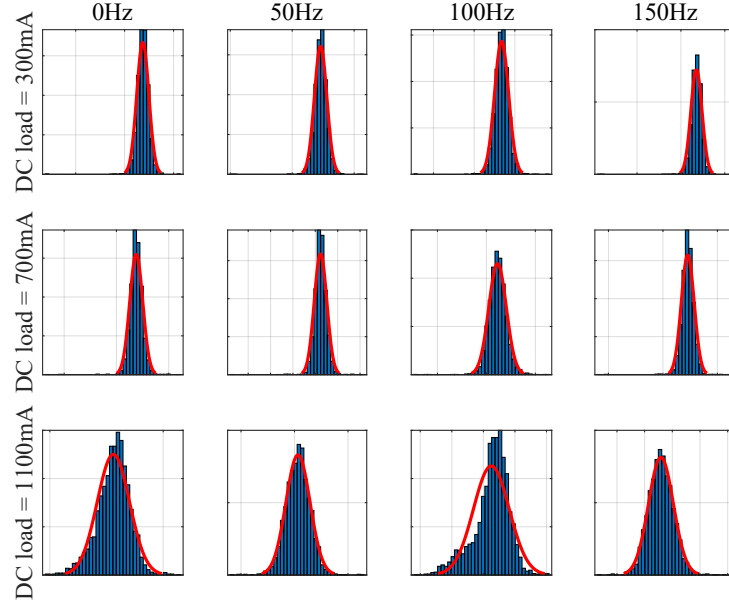
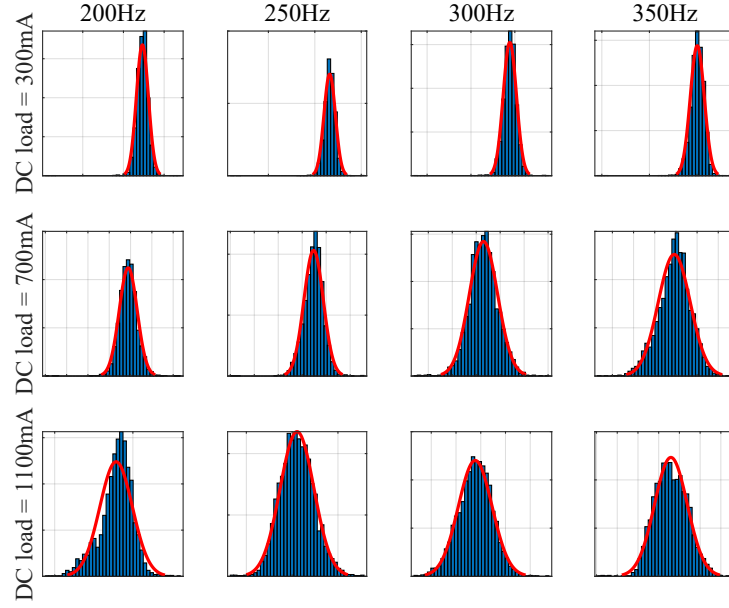


Figure S5: An example of the fluctuations of harmonics power modeled by lognormal distribution (similar to Fig. 4 in the paper).



(a) Low-frequency harmonics



(b) Mid-frequency harmonics

Figure S6: Histogram fits of lognormal distribution for different harmonics and different DC load levels (similar to Fig. 5 in the paper).

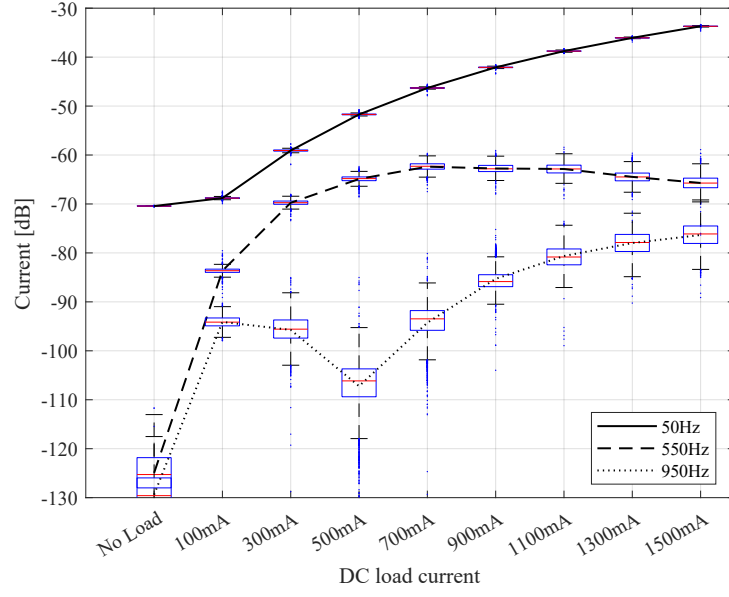


Figure S7: Box-plot of the levels of the different harmonics power as a function of DC load current (similar to Fig. 7 in the paper)..

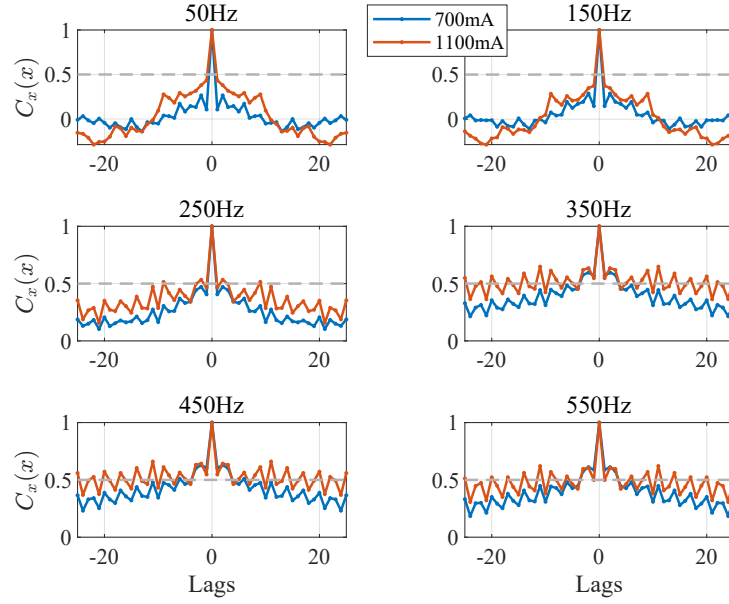


Figure S8: ACF of harmonics powers for different frequencies (similar to Fig. 8 in the paper).

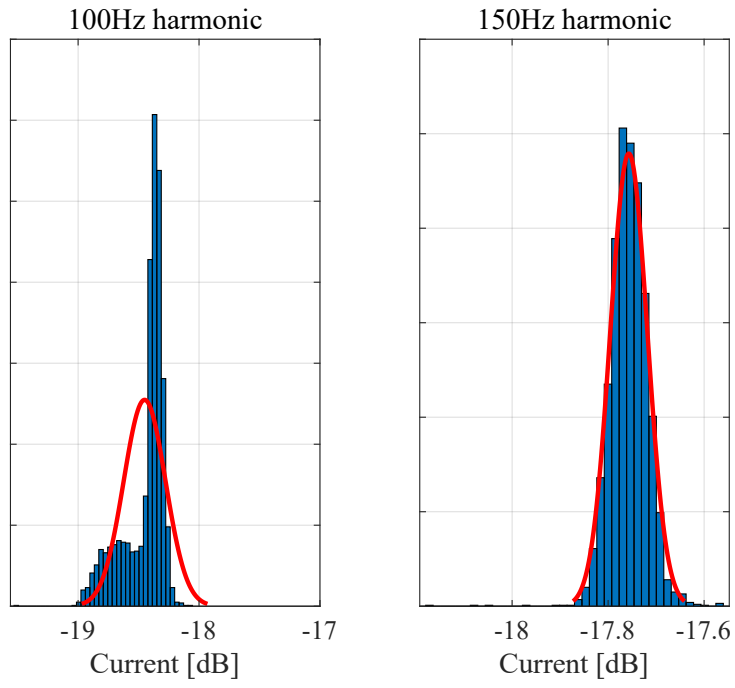
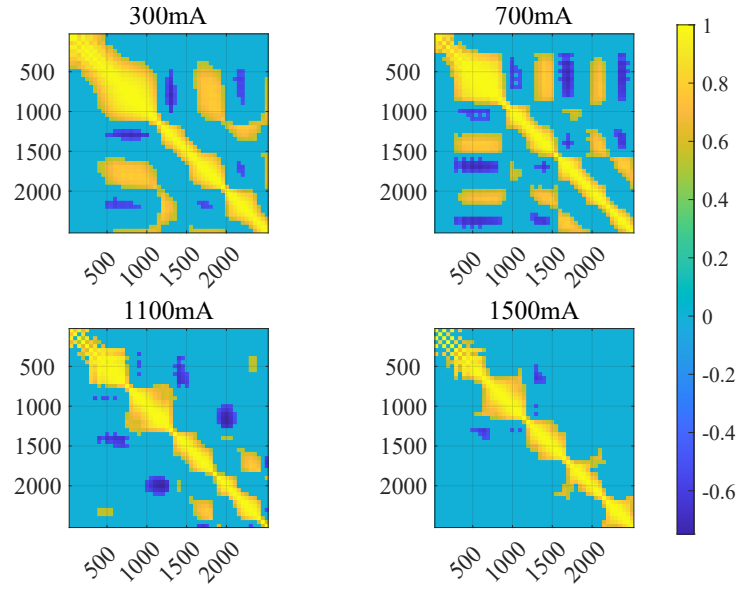
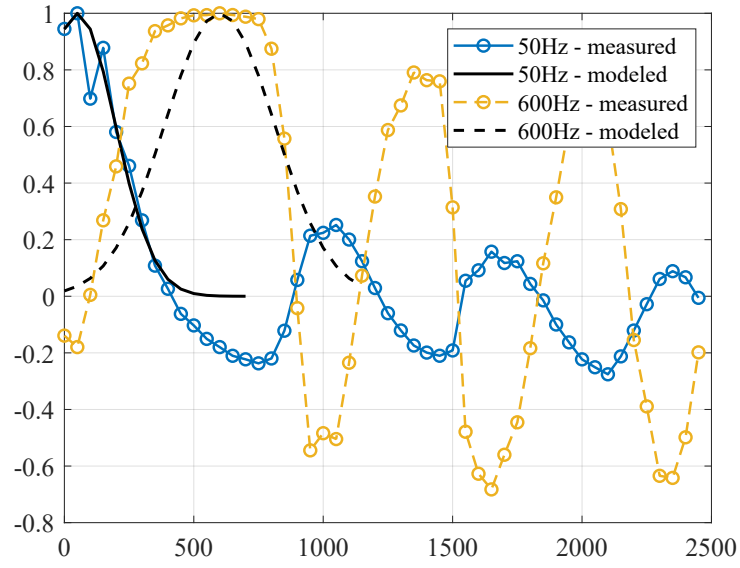


Figure S9: Even harmonics at high load can only barely be lognormal modeled (similar to Fig. 11 in the paper).



(a) Covariance matrix



(b) Selected harmonics

Figure S10: Correlation of harmonics coefficients (similar to Fig. 9 in paper).

4 Power Supply 3 Plots

This section reproduces Figs. 4, 5, 8, 9, 11 from the paper for power supply 2.

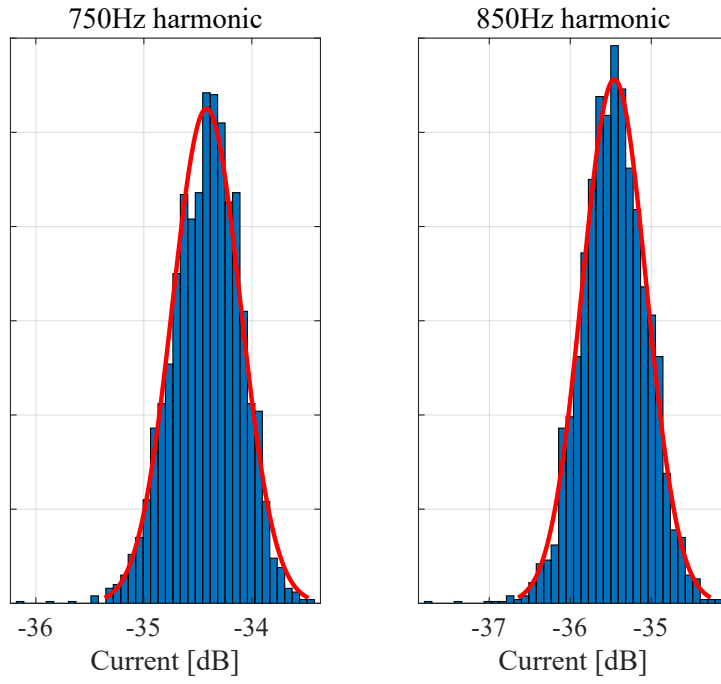
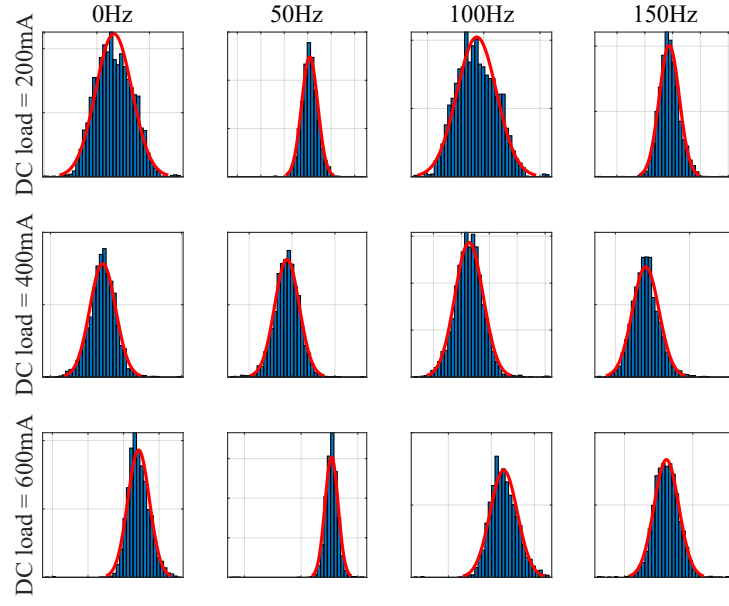
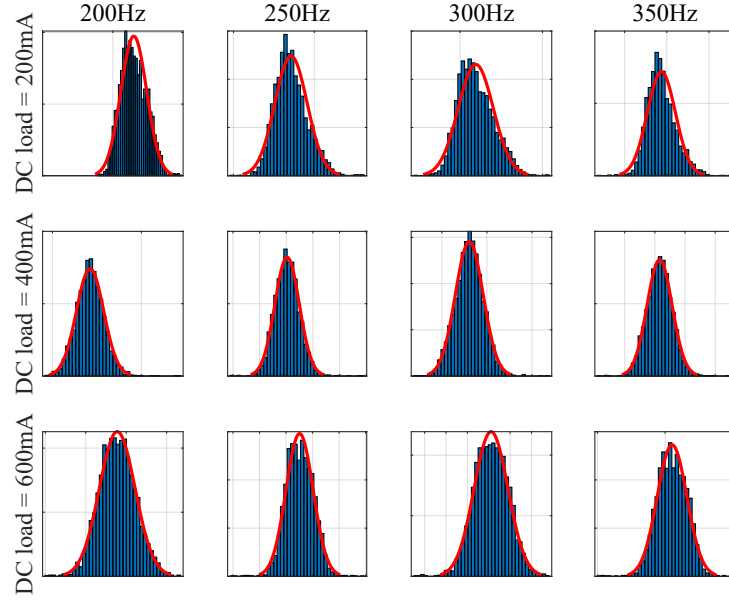


Figure S11: An example of the fluctuations of harmonics power modeled by lognormal distribution (similar to Fig. 4 in the paper).



(a) Low-frequency harmonics



(b) Mid-frequency harmonics

Figure S12: Histogram fits of lognormal distribution for different harmonics and different DC load levels (similar to Fig. 5 in the paper).

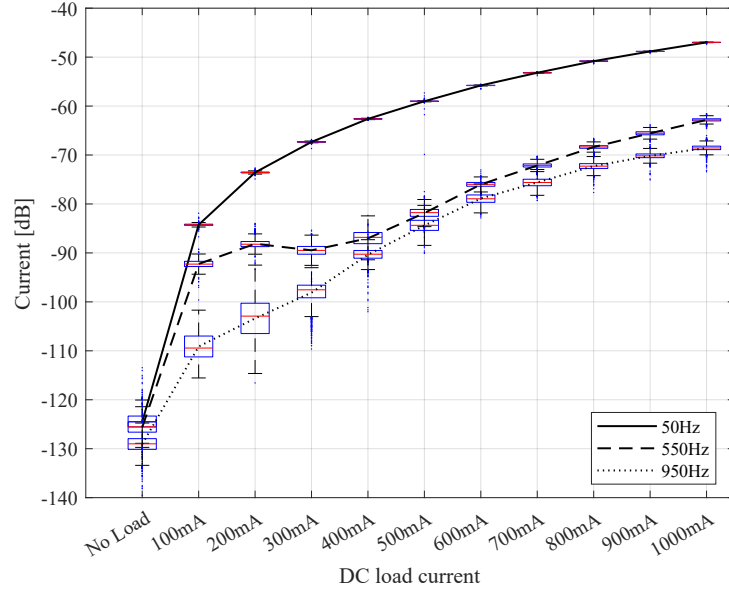


Figure S13: Box-plot of the levels of the different harmonics power as a function of DC load current (similar to Fig. 7 in the paper)..

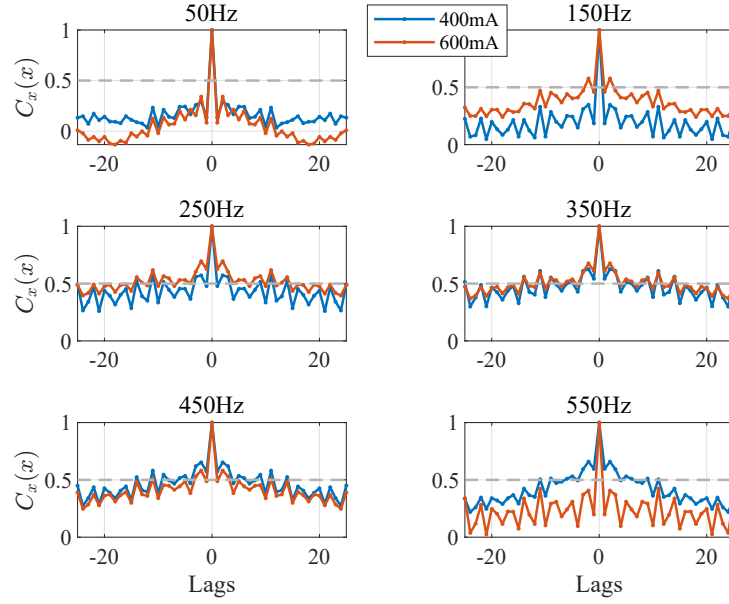
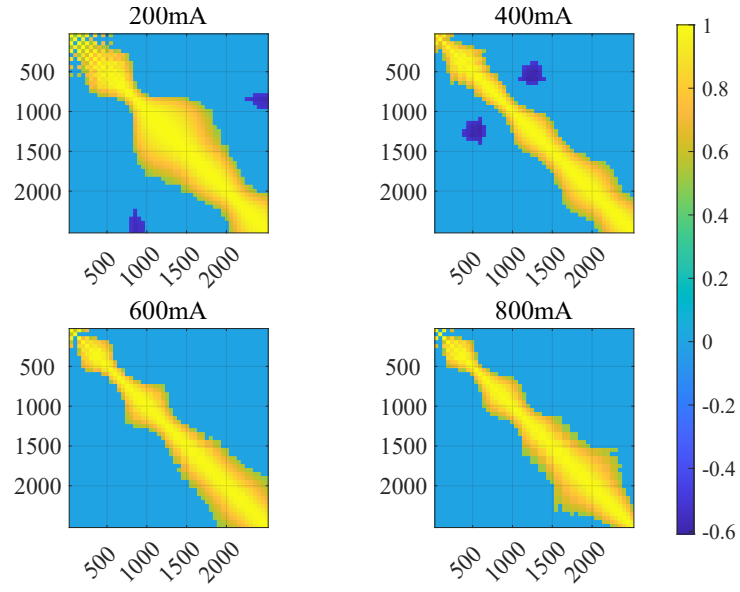
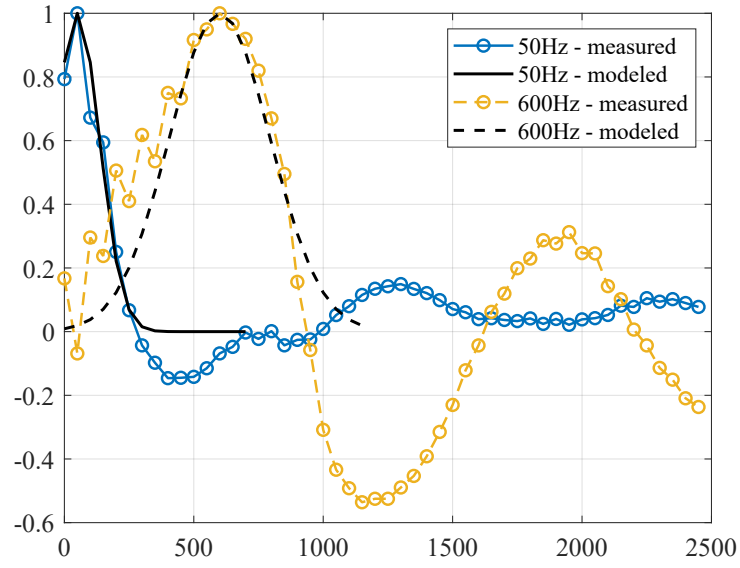


Figure S14: ACF of harmonics powers for different frequencies (similar to Fig. 8 in the paper).



(a) Covariance matrix



(b) Selected harmonics

Figure S15: Correlation of harmonics coefficients (similar to Fig. 9 in paper).

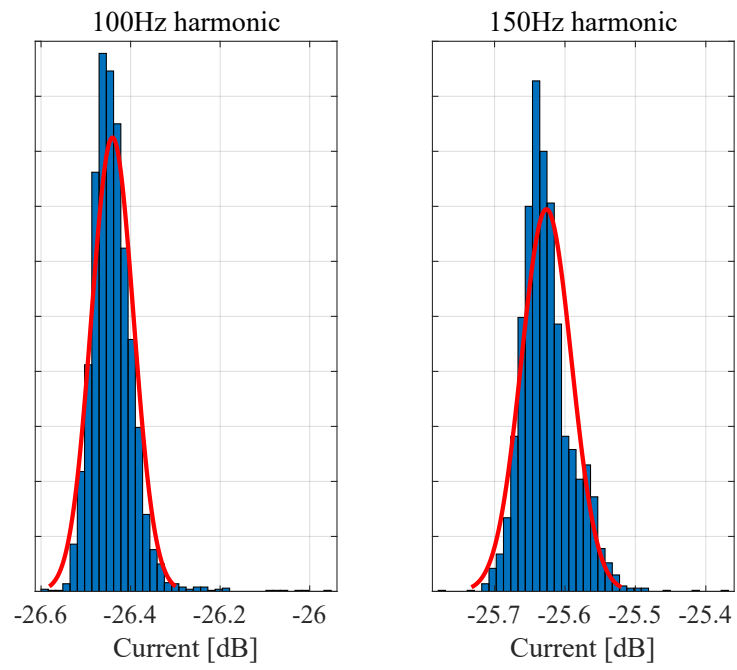


Figure S16: In this case harmonics at high load are still close to the lognormal model (see Fig. 11 in the paper).