

Supplementary data

LCI data processing

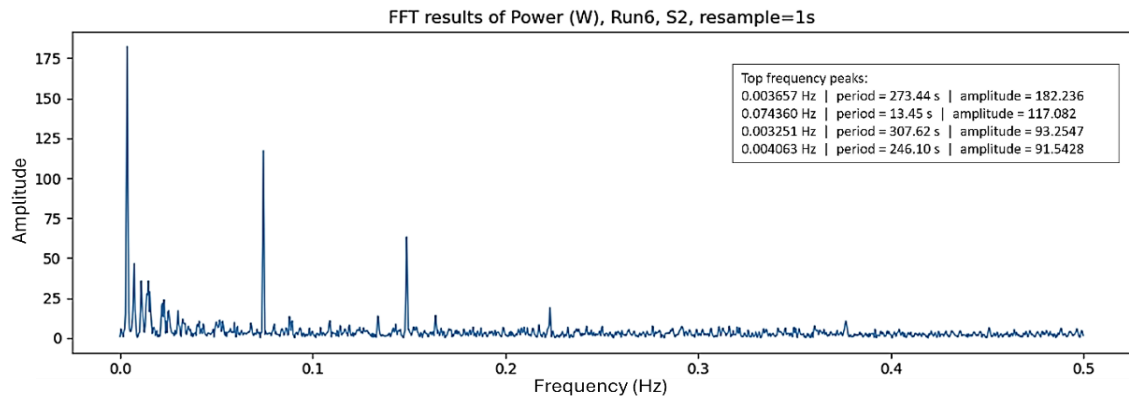


Figure 1 Fast Fourier transform results of power in watts, for run 6, parameter settings S2, the resample size is one second

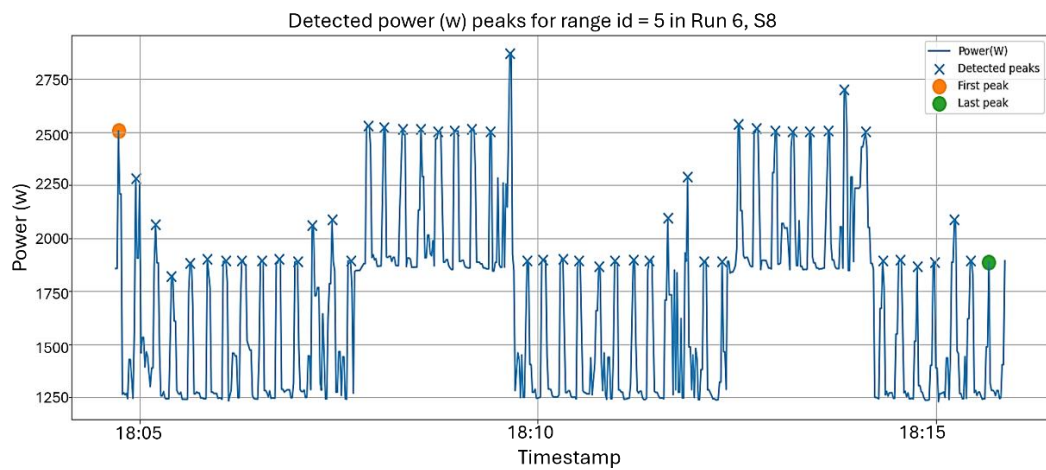


Figure 2 Detected power peaks for range id=5, from run 6, and parameter setting S8 to identify the number of layers within a timestamp of 11 minutes

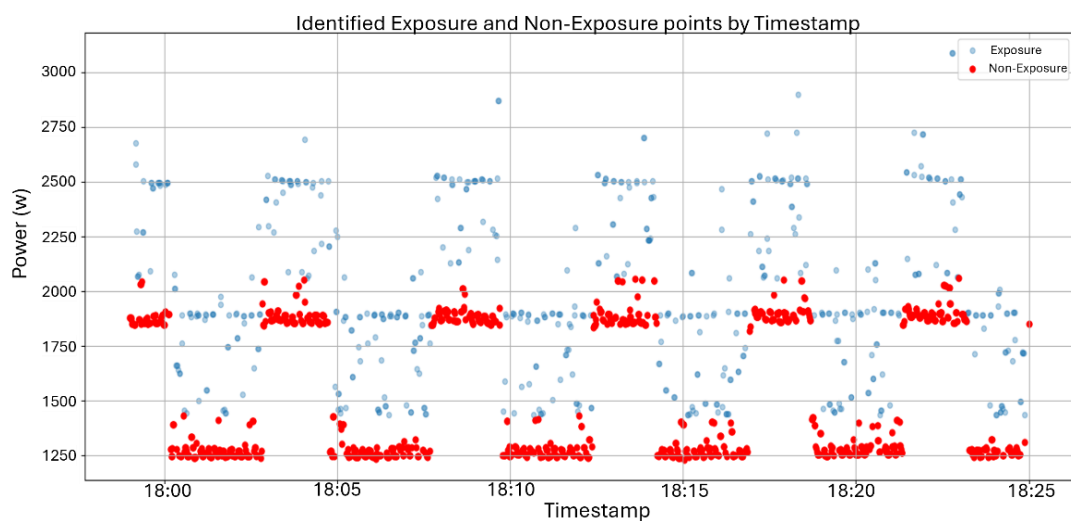


Figure 3 Identified exposure and non-exposure datapoints visualized in different colors, by a time range of 11 minutes.

Table 1 Results of the data parsing for 8 parameter settings in nitrogen environment, with exposure time and non-exposure time, which is further used for energy consumption for 8 parameter settings

Parameter ID (Nitrogen)	Exposure time t_i (s)	Non-exposure time t_n (s)	Time per layer (s)
S1	4.43	9.31	13.74
S2	4.13	9.32	13.45
S3	4.43	9.31	13.74
S4	4.13	9.32	13.45
S5	4.34	9.3	13.64
S6	4.03	9.31	13.34
S7	4.33	9.3	13.64
S8	4.03	9.31	13.34

Data logging system and data analysis

The data logging system python script and the datasets can be found in the repository on Zenodo platform with this [Link \(Click\)](https://doi.org/10.5281/zenodo.21704348).

DOI: <https://doi.org/10.5281/zenodo.21704348>

Sample preparation methods

Table 2 Recipe for the polishing procedure before the porosity analysis with microscopes with machine Struers Tegramin-20 to the level of 0.25 μm

Surface	Suspension	Lub.	Time/minute
Primo 220		Water	2
Piano 500		Water	2
Largo	Diap. All/Lar .9		3
Mol	Diap. Mol3		3
Nap	Diap. Nap-B1		3
Nap	Diap. Nap1/4		3