Calibration report

Automatically generated by calibro-V2.2

url to be included

Calibration: simplest

November 13, 2025

Calibro

Executive Summary

This document reports the outcomes of the calibration *simplest*. Here below are listed the main results consisting of model parameters estimates and confidence intervals (Table 1), and the model prediction error, quantified by the Root Mean Squared Error (RMSE), before and after calibration (Table 2).

Table 1: Estimates and confidence intervals for the model parameters.

PARAMETER	ESTIMATE	LOWER	UPPER
b10_airloophvac	0.998	0.835	0.998
d2_htgsp_office_st	15.328	14.505	16.266
e1_natural_ventilation_rate	0.884	0.617	0.893
a5_infiltration_rate	0.000	0.000	0.000

Table 2: Goodness of fit before and after calibration.

DATASET	BEFORE	AFTER
data1	0.006	0.007

The following sections contain a more comprehensive breakdown of the calibration results, according to the undertaken calibration steps.

- Section 1 depicts the main calibration results, with graphs and tables.

1 Calibration results

Model calibration is undertaken by exploring each parameter's space, having boundaries as defined by the provided samples, via a Markov Chain Monte Carlo algorithms, in order to infer the values reducing the discrepancy between model predictions and supplied measurements. This section describes the results obtained through this process. There are 4 outputs, which are listed here below.

- The recommended, the minimum and the maximum values for the input parameters (Table 3). The first value is the value that produces the best fit to the measurement, while the second and third values quantify the residual parameter uncertainties.

- The probability density distribution of the calibration parameters after calibration (i.e. the empirical probability density distribution of the input parameters from the Markov Chain Monte Carlo sampling). Figure 1 shows the outcome. The upper panels illustrate correlation scatter plots for pairs of parameters. The red line qualitatively indicates the correlation between parameters, as flat lines indicates low level of correlation and vice-versa. In the diagonal panels are depicted the marginal posterior probability density distributions. The lower panels present kernel estimation of the posterior joint probability density distributions for pairs of model parameters. Clearer colors indicates higher values.

- The meta-model's Root Mean Squared Error (RMSE; an estimate of the likely error within the predictions) before calibration (i.e. the RMSE between the best provided simulation and the measurements), and after calibration (i.e. the RMSE between the calibrated meta-model output and the measurements). Table 4 lists the outcomes.

- The obtained fit between measured target variable and meta-model predictions. Figure 2 display this result.

It must be kept in mind that the meta-mode is an approximation, and its output may be qualitatively different from that of the real model. Therefore it is necessary to verify by feeding back the recommended values into the actual model.

Table 3: estimates and confidence intervals for the model parameters.

PARAMETER	ESTIMATE	LOWER	UPPER
b10_airloophvac	0.998	0.835	0.998
d2_htgsp_office_st	15.328	14.505	16.266
e1_natural_ventilation_rate	0.884	0.617	0.893
a5_infiltration_rate	0.000	0.000	0.000

Table 4: Goodness of fit before and after calibration.

DATASET	BEFORE	AFTER
data1	0.006	0.007

```
## Warning in par(usr):  argument 1 does not name a graphical parameter
## Warning in par(usr):  argument 1 does not name a graphical parameter
## Warning in par(usr):  argument 1 does not name a graphical parameter
## Warning in par(usr):  argument 1 does not name a graphical parameter
```
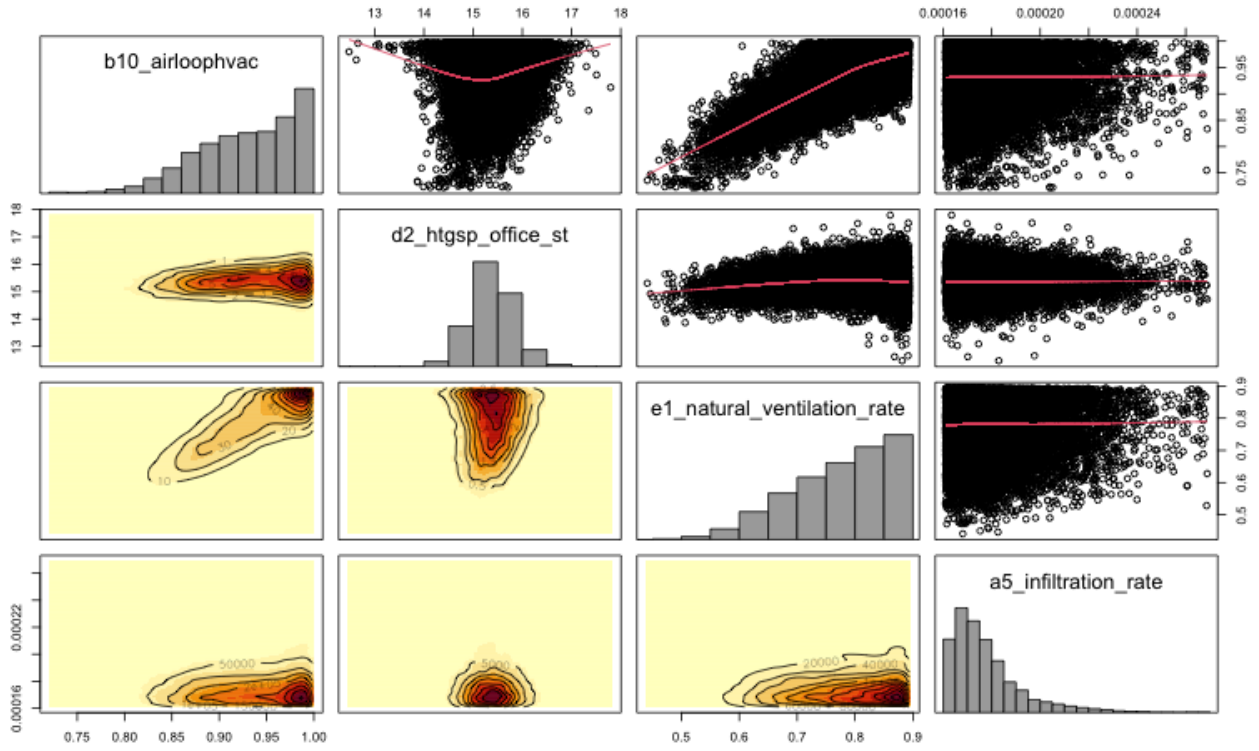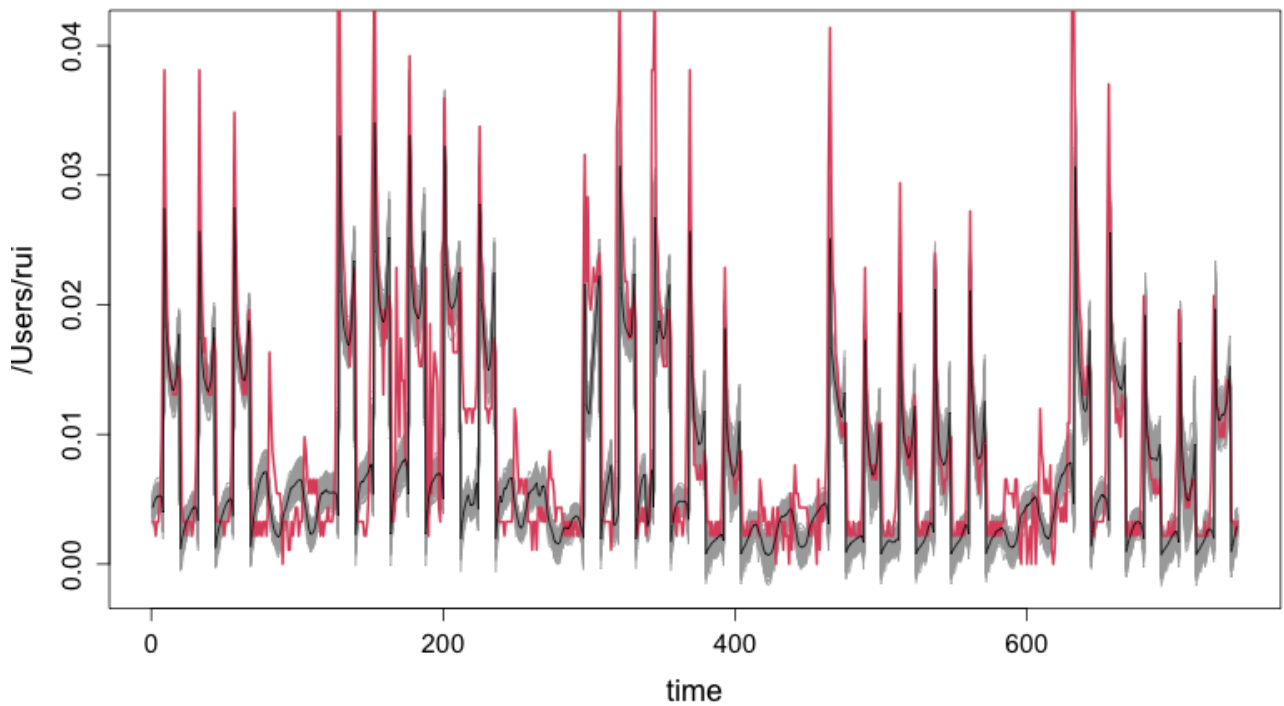
Figure 1: calibration parameters posterior probability density distributions

Figure 2: achieved fit for dataset data1