How to run the Matlab script

We developed a MATLAB[®] routine which can perform different regressions including residual analysis of data from a wide range of chamber experiment set-ups.

1. Preparation of data files

Three different datasheets are needed:

The <u>Headerfile</u> must contain two timestamp columns (starttime and endtime) to define the measurement period. Further additional information for each of the single measurements (e.g. ID of sampling site, basal area of sampling plot, light or dark measurement) can also be added.

The <u>Rawdatafile</u> must contain a timestamp column and data from the gas analyzer. It can also contain other parameters (in this example: PAR, T and VWC) if they are recorded with the same timestamp.

The <u>Metdatafile</u> must again contain a timestamp column. In this example it contains a timestamp (30:00 minutes; time interval 10:00:00-10:30:00 = 10:30:00) whose frequency is not the same as the timestamp in the Rawdata file (selection of matching metdata is done in lines 375-380 in the script).

Note: If the timestamp of your datafiles differs from those used in these example files, small corrections to the script are needed.

All files have to be formatted into .csv and should not contain any text (Header title rows have to be removed). The timestamp columns have to be formatted as a number with 10 decimal places (Fig. 1 and Fig. 2)

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Figure 1 - Headerfile with two date columns and additional information

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Figure 2 - Formatted Headerfile contains only numbers, all description has been removed

2. Running the script

To run the script the function "chamberflux_example" has to be entered into MATLAB Command Window as shown in Figure 3.

Explanation of function arguments: chamberflux_example – function name headerfilename – name of Header file ('Example_Header.csv') rawdatafilename – name of Rawdata file ('Example_Rawdata.csv') metdatafilename – name of Metdata file ('Example_Metdata.csv') resultsfilename – name of Results file ('Example_Results.csv') startrowheader – number of row in the Header file from which calculation should be started control – manual adjustment of discard intervals ('m') or automatic run with fixed intervals ('f') discardstart – interval which should be discarded at the start of each flux calculation (in s; e.g. '10') interval – time interval for flux calculation (in s)

mode - options: '0': t=0 at headerdata(i,1)+discardstart; '1': t=0 at headerdata(i,1)

before – interval to be plotted in output prior to flux calculation begins (in s)

after – interval to be plotted in output at end of flux calculation window (in s)

gas – gas of interest (in this script: 'CH_4', 'CO_2' or 'H_2O')

watercorrection - options: '0' water correction will not be applied; '1' water correction will be applied

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Figure 3 - calling the function in the command window

3. Manually shifting of the start- and endtime of flux calculations

It is possible to change start- and endtime of flux calculation on a visual basis (Fig. 4) by using the 'discardint.'-button. By moving the position of the vertical blue lines the startand end-time can be adjusted. The new calculation using this manual time window will be run upon clicking the 'recalculate'-button.



Figure 4 - Adjustment of flux calculation window

4. Results

Each flux calculation result is saved in the Results file after clicking the 'Next'-button. Two Headers (Results and Metresults) are in the folder which can be inserted into the Results files via 'copy & paste'. Date columns have to be reformatted from a number with 10 decimal places to a date.

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