

INSTALLATION OF THE SIMULATOR:

Copy MATLAB script (*AVKsimulator.m*) or Python script (*AVKsimulator.py*) in any directory but together with the folder that contains the regularisations matrices (the folder *regularisation*).

USE OF THE WORKING EXAMPLE:

Copy the MATLAB script (*working_example.m*) or Python script (*working_example.py*) as well as the example data file (*example_ECHAM5wiso_20140212hh00.nc*) and the a priori data file (*apri.dat*) in the same directory as the simulator routine. Then you can execute the 'working_example'-routine and the output file (*example_output.dat*) will be generated.

CONTENT OF *example_output.dat*:

The generated ascii file *example_output.dat* has 19 columns, which have the following content:

Column 1, lon: longitude [°]

Column 2, lat: latitude [°]

Column 3, GNDalt: ground altitude [m]

Column 4, SKINtemp: surface skin temperature [K]

Column 5, cld: cloud flag (1 mean cloud, 0 means no cloud)

Column 6, DOFS_T1: DOFS for H₂O proxy of Type 1 product

Column 7, DOFS_T2: DOFS for H₂O (as well as δD) of Type 2 product

Column 8, altbest: altitude with best sensitivity for Type 2 δD product (calculated according to Eq. 7 of the manuscript)

Column 9, Sensbest: serr value for altitude with best sensitivity (calculated according to Sect. 4.2.1 of the manuscript)

Column 10, MH2Obest: H₂O raw model data [ppmv] for altitude 'altbest'

Column 11, MdelDbest: δD raw model data [unity] for altitude 'altbest'

Columns 12 and 13, smMH2Obest and smMdelDbest: same as Columns 10 and 11, but after passing through the retrieval simulator

Columns 14 – 19: same as Columns 8 – 13, but for the altitude closest to 5km a.s.l.