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The Community Intercomparison Suite (CIS): an open-source toolbox

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Weather and climate models as well as earth observations create vast amounts of data providing invaluable information for the earth system science community. Often, however, only a small subset of this data is actually utilised, typically in highly aggregated form. The Community Intercomparison Suite (CIS) is an open-source Python library and command line tool which allows the straight-forward quantitative analysis, intercomparison and visualisation of remote sensing, in-situ and model data.

CIS can read gridded and ungridded remote sensing, in-situ and model data - and many other data sources 'out-of-the-box', such as ESA Aerosol and Cloud CCI product, MODIS, Cloud CCI, Cloudsat, CALIOP and AERONET. Perhaps most importantly however CIS also employs a modular plugin architecture to allow for the reading of limitless different data types.

To enable the intercomparison of this data CIS provides a number of analytic operations, including: the aggregation of ungridded and gridded datasets to coarser representations using a number of different built in averaging kernels; the subsetting of data to reduce its extent or dimensionality; the co-location of two distinct datasets onto a single set of co-ordinates; as well as numerous other visualisation and statistical tools. These operations can be performed efficiently on local machines or large computing clusters - and is already available on the JASMIN computing facility.

We will demonstrate the capability of CIS for co-location, comparison and visualisation of Aerosol Optical Depth (AOD) from the ECMWF MACC reanalysis, Level2 Aerosol CCI satellite observations and from the ground base sunphotometer network AERONET. The use of an open-source, community developed tool in this way opens up a huge amount of data which would previously have been inaccessible to many users, while also providing replicable, repeatable analysis which scientists and policy-makers alike can trust and understand.