



Namelist driven, tailor-made on-line diagnostic and output control using the Modular Earth Submodel System (MESSy)

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Long-term and/or high resolution simulations with geoscientific models become more and more limited by storage space. Therefore, on-line diagnostic tools calculating the target variables directly during the model simulation become increasingly important. These are for example:

- (1) simple statistics w.r.t. time, such as monthly mean, standard deviation, minimum, maximum or event counting,
- (2) the output on distinct surfaces (e.g., pressure levels, potential vorticity iso-surfaces),
- (3) output of data along satellite tracks,
- (4) the renaming of variables, as e.g. required by the CMOR standard,
- (5) redirection of a set of variables into specific output files, etc..

Models equipped with the MESSy infrastructure provide all of the above mentioned on-line diagnostic tools. The output control is fully namelist driven. All of the above mentioned diagnostic is applicable to all variables without any modification of the code.

Especially option (1), (4) and (5) are important to reduce the post-processing efforts usually required for contributions to joint model inter-comparison projects. Therefore, at the CLM-Assembly 2017 it was decided that the MESSy infrastructure will be implemented into the official COSMO-CLM release, providing the CLM-community members with the possibility to take advantage of the MESSy on-line diagnostic capabilities.

However, MESSy is not only implemented into the COSMO model. The same diagnostic functionalities are available in ECHAM5/MESSy, CESM1/MESSy and ICON/MESSy.