

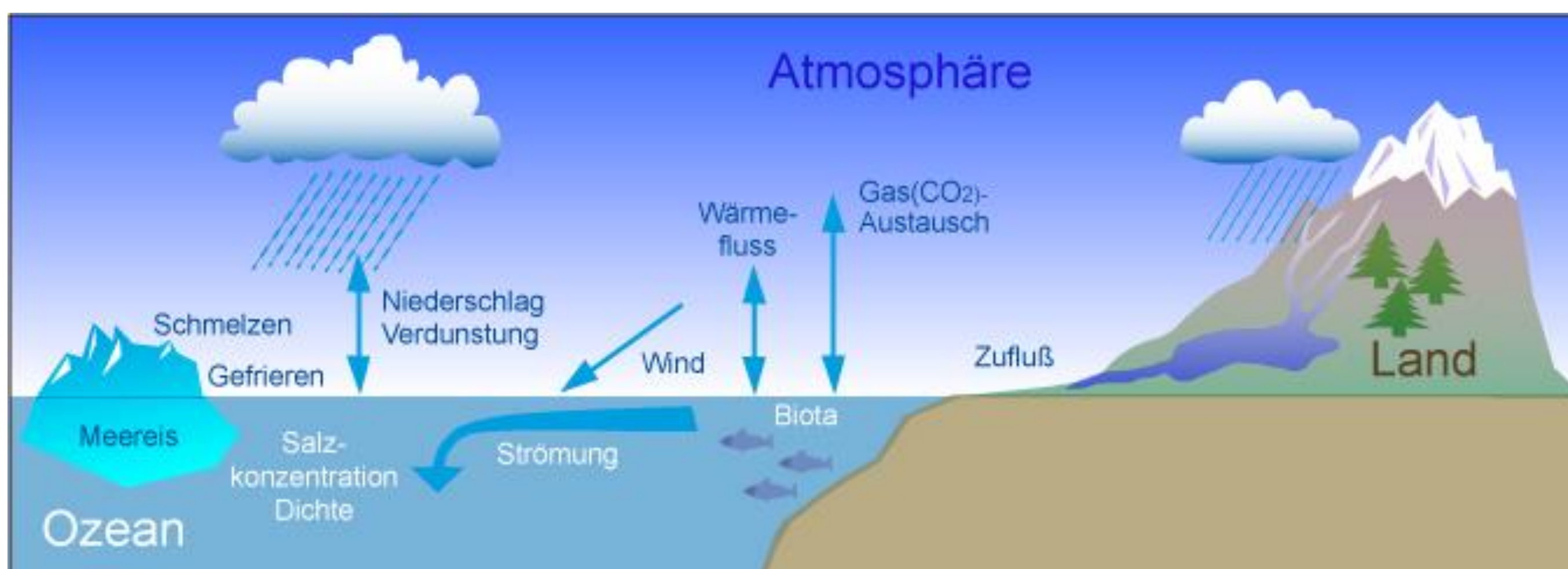
COSMO/CLM regional climate system model: Description and performance

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Motivation:

In the last years, the idea to build a regional earth system model grew in the CLM-community and it ended up in our science plan (2014):

“[One of our goals is to] extend the versatility and applicability of COSMO-CLM by adding new modules and processes aiming towards the development of a regional earth system model”.

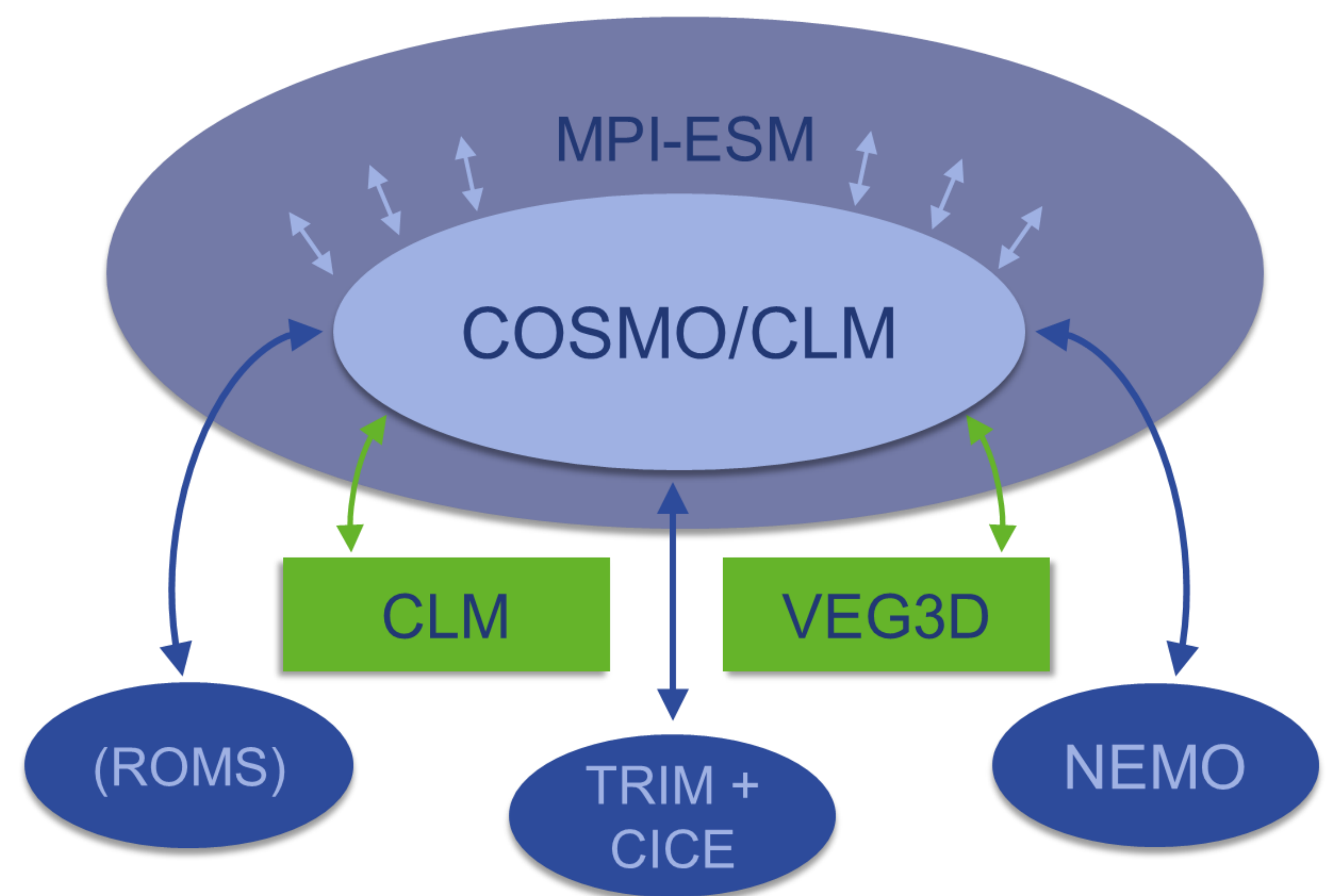
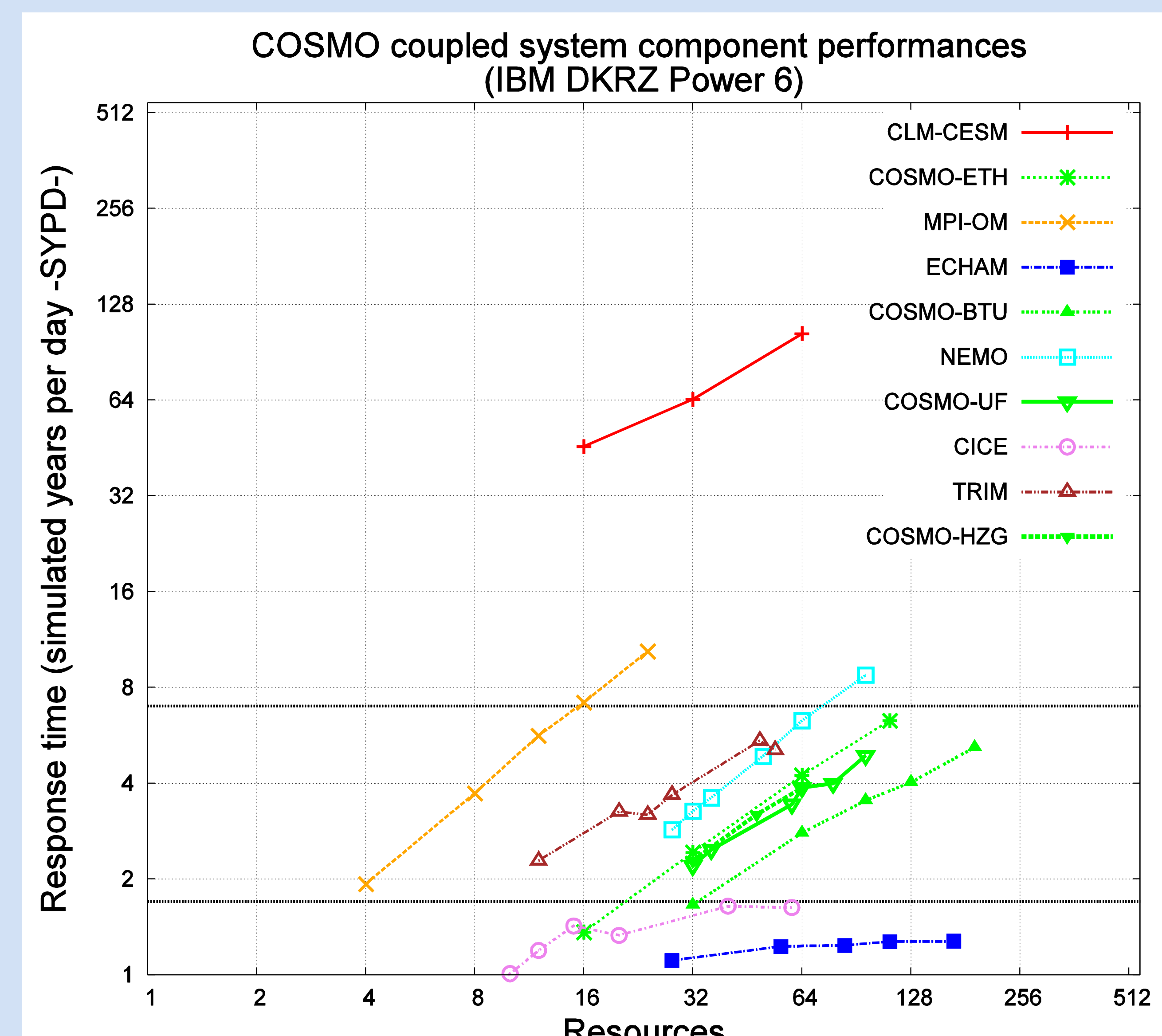


In several topics of the CLM-Community, COSMO-CLM was coupled to various other model components, i.e. for ocean, land, and sea ice processes, as well as a two way nesting for the atmosphere with the OASIS3 coupler and some also with MESSy.

The common effort to combine all OASIS3 coupling initiatives within one version of COSMO-CLM will be presented here. Inside the OASIS project group of the CLM-Community, the individual OASIS based coupling efforts were combined in one Unified Interface to open the opportunity to coupled several model components parallel to COSMO-CLM. OASIS3-MCT2 was chosen as the coupling interface with the possibility of parallel coupling.

The performance of the individual coupled systems are investigated on the basis of a set of comparable simulations on the same computer platform (DKRZ).

Scalability of the coupled systems



Conclusions:

The first results show a cooling of the atmosphere over Central Europe of over 1°C, most pronounced in winter.

An additional analysis of the wind directions revealed, that the changes in temperature are related to changes of the wind from the north. Whereas the changes in precipitation are not dependent on the wind direction.

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Literature

Sophie Valcke, Tony Craig, Laure Coquart, 2013: OASIS3-MCT User Guide, OASIS3-MCT 2.0, Technical Report, TR/CMGC/13/17, CERFACS/CNRS SUC URA No 1875, Toulouse, France

