Project 469: Control Experiments for COSMOS

COSMOS is a community network towards the development of a fully developed Earth system model.

The complexity of ESMs requires the involvement of an interdisciplinary team of scientists to develop Earth system models. This team has to be ready to work together intensively and share the knowledge and expertise of the team partners. So COSMOS constitutes a team of experts to develop a flexible and portable model infrastructure, following and supporting the ideas of the PRISM initiative.

The purpose is not only to develop models and their infrastructure, it is also to use them to address challenging problems involving the interactions between different components of the Earth system. These models will be central tools to assess important feedback processes in the Earth system, to assess environmental risks, and to develop mitigation and adaptation strategies.

The COSMOS network crucially depends upon the availability and easy access to models. These models do not only have to be very well tested and mature, but also scientifically and technologically very advanced. The high quality of the cosmos models can only be ensured via the conduction of extensive test and control experiments. The project 469 is intended to provide the necessary resources for such experiments. Please find below a first estimate for the compute times required for these tests:

<u>100 years T31L19/GR3.0</u>

- cosmos-ao 310 CPUh
- cosmos-asob 410 CPUh

<u>100 years T63L31/GR1.5</u>

- cosmos-ao 3500 CPUh
- cosmos-asob 4200 CPUh (without CO_2- transport)

The storage requirements are deduced from these estimates for compute time. As it is planned to conduct control experiments the storage must be long-term (>10 years). Numbers are for the planned 2 control experiments per model subset:

- cosmos-ao T31L19 : 668 GB
- cosmos-ao T63L31 : 6040 GB
- cosmos-asob T31L19: 676 GB
- cosmos-asob T63L31: 3304 GB

or in total about 18 TB for 3 experiments.