

REQUEST FOR ADDITIONAL RESOURCES IN THE CURRENT YEAR FOR AN EXISTING SPECIAL PROJECT

MEMBER STATE: Germany

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Project title: The role of soil moisture and surface- and subsurface water flows on predictability of convection

Project account: **SPDEARNA**

Additional computer resources requested for	2017
High Performance Computing Facility (units)	5 000 000
Data storage capacity (total) (Gbytes)	1500

Continue overleaf

¹ The Principal Investigator is the contact person for this Special Project

Technical reasons and scientific justifications why additional resources are needed

The WRF-Hydro setup with 550x550 horizontal grid point at a 2.8 km resolution has been selected in order to test the physically-based stochastic perturbation (PSP) scheme of Kober and Craig (2016), in the case of the forecast of a peak discharge event in the Inn river basin in Austria / Germany during the 3 - 4 June 2010. One simulated day with this WRF-Hydro setup costs 4 400 SBU.

This setup is operated for a three-month period for three Planetary Boundary Layer (PBL) schemes, using the ECMWF operational analysis as boundary condition. This is to generate three sets of realistic soil state initialisation (soil moisture, soil temperature, river head). This costs $3 \times 61 \times 4\,400 = 1\,214\,400$ SBU.

This setup is operated in an ensemble forecast mode using the ECMWF deterministic forecast data as boundary condition. Three ensemble sets are considered. The first one is based on three PBL parameterization schemes, and the second one is based on three realization of the PSP. The third one is based on three PBL parameterization schemes, but driven by the ECMWF operational analysis instead, and is considered as a reference. Each ensemble also considers the three different soil initialization, which makes a sum of nine members per ensemble. One simulated day of the three sets of ensemble costs $3 \times 9 \times 4\,400 = 118\,800$ SBU.

Five initial time for this ensemble forecast are considered, i.e 2, 1 June, 31, 30, 29 May 2010 at 00 UTC, and the forecast is run until 6 June 2010 at 00 UTC. This makes a set of five ensemble forecast runs of duration 4, 5, 6, 7 and 8 days, which costs:
 $(4 + 5 + 6 + 7 + 8) * 118\,800 = 3\,564\,000$ SBU.

Bibliography

Kober, C, GC, Craig, 2016: Physically based stochastic perturbations (PSP) in the boundary layer to represent uncertainties in convective initiation, J. Atmos. Sci., 73, 2893-2911.