



## **The Centre of High-Performance Scientific Computing, Geoverbund, ABC/J – Geosciences enabled by HPSC**

Stefan Kollet (1,2), Klaus Görger (2,3), Harry Vereecken (1,2), Fabian Gasper (1,2), Harrie-Jan Hendricks-Franssen (1,2), Jessica Keune (2,4), Ketan Kulkarni (2,3), Wolfgang Kurtz (1,2), Wendy Sharples (2,3), Prabhakar Shrestha (4), Clemens Simmer (2,4), Mauro Sulis (4), Jan Vanderborght (1,2)

(1) Research Centre Jülich, IBG-3 (s.kollet@fz-juelich.de), (2) Centre for High-Performance Scientific Computing in Terrestrial Systems, Geoverbund ABC/J, (3) Research Centre Jülich, Jülich Supercomputing Centre, (4) Bonn University, Meteorological Institute

The Centre of High-Performance Scientific Computing (HPSC TerrSys) was founded 2011 to establish a centre of competence in high-performance scientific computing in terrestrial systems and the geosciences enabling fundamental and applied geoscientific research in the Geoverbund ABC/J (geoscientific research alliance of the Universities of Aachen, Cologne, Bonn and the Research Centre Jülich, Germany). The specific goals of HPSC TerrSys are to achieve relevance at the national and international level in (i) the development and application of HPSC technologies in the geoscientific community; (ii) student education; (iii) HPSC services and support also to the wider geoscientific community; and in (iv) the industry and public sectors via e.g., useful applications and data products. A key feature of HPSC TerrSys is the Simulation Laboratory Terrestrial Systems, which is located at the Jülich Supercomputing Centre (JSC) and provides extensive capabilities with respect to porting, profiling, tuning and performance monitoring of geoscientific software in JSC's supercomputing environment. We will present a summary of success stories of HPSC applications including integrated terrestrial model development, parallel profiling and its application from watersheds to the continent; massively parallel data assimilation using physics-based models and ensemble methods; quasi-operational terrestrial water and energy monitoring; and convection permitting climate simulations over Europe. The success stories stress the need for a formalized education of students in the application of HPSC technologies in future.