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# Programme

## Wednesday

9:00 Registration + coffee

9:30 Opening

9:45 Geoverbund ABC/J - The Geoscientific Network of RWTH Aachen, University of Bonn, University of Cologne, and Forschungszentrum Jülich  
*Daniel Felten*

10:00 Lagrangian Predictability of Coupled Water Processes (invited)  
*Ana P. Barros*

10:30 High-resolution climate modeling on emerging supercomputing platforms: Opportunities and challenges (invited)  
*Christoph Schär*

11:00 Understanding the connection between root zone soil moisture and surface energy flux partitioning using modeling, observations and data assimilation for a temperate grassland site in Germany  
*Prabhakar Shrestha, Wolfgang Kurtz, Gerd Vogel, Jan-Peter Schulz, Mauro Sulis, Harrie-Jan Hendricks Franssen, Stefan Kollet and Clemens Simmer*

11:15 Propagation of patterns from soil, vegetation and weather to soil moisture and surface fluxes  
*Tim G. Reichenau, Wolfgang Korres, Sabrina Esch and Karl Schneider*

11:30 Break

12:00 Characterizing heat and mass flux patterns in agricultural crops using landsurface and crop modelling approaches  
*Matthias Langensiepen, Moritz Kupisch, Mauro Sulis, Anke Schickling, Hubert Hüging, Thuy Huu Nguyen, Anja Stadler and Frank Ewert*

12:15 Comparison of water balance and root water uptake models in simulating CO<sub>2</sub> and H<sub>2</sub>O fluxes and growth of wheat  
*Thuy Huu Nguyen, Matthias Langensiepen, Jan Vanderborght, Hubert Hueging, Cho Miltin Mboh and Frank Ewert*

12:30 Aerodynamic Roughness Length over Heterogeneous Surface  
*Yaping Shao and Sascha Runge*

12:45 Lunch

## Modelling

14:00 Advancing continental scale hydrology from bedrock to atmosphere and from summit to sea (invited)

*Reed Maxwell, Lauren Foster, Caitlin Collins, Mary Forrester, Danielle Tijerina and Laura Condon*

14:30 Increasing the depth of a Land Surface Model: implications for the subsurface thermal and hydrological regimes  
*Norman Steinert, Jesus Fidel González-Rouco, Stefan Hagemann, Philipp DeVrese, Elena García-Bustamante, Johann Jungclaus and Stephan Lorenz*

14:45 How human water use induced atmospheric feedbacks may contribute to continental drying  
*Jessica Keune, Mauro Sulis, Stefan Kollet, Stephan Henne, Anita Drumond, Stefan Siebert, Yoshihide Wada and Diego Miralles*

15:00 Multi-model assessment of hydrologic impacts of climate change in a semi-arid Mediterranean catchment  
*Enrica Perra, Monica Piras, Roberto Deidda, Claudio Paniconi, Giuseppe Mascaro, Enrique R. Vivoni, Pierluigi Cau, Pier Andrea Marras, Swen Meyer and Ralf Ludwig*

15:15 When Does Uncertainty Matter While Modeling Climate Change in Mountain Headwaters? Contrasting model resolution and complexity under a changing climate in an alpine catchment  
*Lauren M. Foster, Kenneth Williams and Reed M. Maxwell*

15:30 Regional climate modelling at the convection permitting scale: Climate response to increasing greenhouse gasses and land use change (invited)  
*Nicole van Lipzig, Sam Vanden Broucke, Hendrik Wouters and Matthias Demuzere*

16:00 Poster session

18:00 Ice breaker

## Thursday

9:00 The Community Terrestrial Systems Model (CTSM): Unifying land modeling efforts to advance research and prediction in climate, weather, water and ecology (invited)  
*Martyn Clark, Dave Lawrence, Bill Sacks, Mike Barlage, Sean Swenson and Mariana Vertenstein*

9:30 OLAM-SOIL: A global soil and Earth system modeling platform (invited)  
*Robert Walko, Dani Or, Simone Fatichi, Harry Vereecken, Stefan Kollet, Tom Hengl and Roni Avissar*

10:00 Coupling reactive transport processes with root system architecture and functions: principles and application examples  
*Frédéric Gérard, Hannah Gatz-Miller, Sergio Bea, Renato K. Braghieri, Philippe Hinsinger, Loïc Pagès and Klaus U. Mayer*

10:15 Hydrological networks as optimal transport structures  
*Enrico Facca, Mario Putti and Franco Cardin*

10:30 Break

11:00 Selected Comparisons between Machine Learning and Deep Learning in Earth Science Applications (invited)  
*Morris Riedel*

11:30 Improved hydrology over peatlands in a global land modeling system  
*Michel Bechtold, Gabrielle J M De Lannoy, Rolf H Reichle, Randal D Koster, Sarith P Mahanama and Dirk Roose*

11:45 3-D physically-based modeling of the Panola hillslope  
*Matteo Camporese, Claudio Paniconi and Mario Putti*

12:00 Representing winter wheat in the Community Land Model (version 4.5) (invited)  
*Yaqiong Lu, Ian N. Williams, Justin E. Bagley, Margaret S. Torn and Lara M. Kueppers*

12:30 Lunch

13:30 Workflows in Geosystems Analysis (invited)  
*Olaf Kolditz, Hua Shao, Uwe-Jens Görke, Haibing Shao, Thomas Nagel, Lars Bilke, Thomas Fischer, Karsten Rink and Thomas Kalbacher*

14:00 Coupled Systems, Numerical Libraries, and High Performance Computing: How Do We Bring These Together? (invited)  
*Carol Woodward*

14:30 Incorporating ICON into TerrSysMP  
*Slavko Brdar, Cunbo Han, Stefan Kollet and Wendy Sharples*

14:45 Linking coupled water-energy engineered system simulation models to HPC resources via a generalised web-interface

*Stephen Knox, James Tomlinson and Julien Harou*

15:00 High Performance Computing in Basin Modeling: Stratigraphic Layer tracking with the Level Set Method  
*Sean McGovern, Stefan Kollet, Wolfgang Bangerth, Claudius Buerger, Ronnie Schwede and Olaf Podlaha*

15:15 Break

15:45 Using Data Assimilation Diagnostics to Assess the SMAP Level-4 Soil Moisture Product (invited)  
*Rolf H. Reichle, Qing Liu, Gabrielle J. M. De Lannoy, Wade T. Crow, John S. Kimball, Randal D. Koster and Joseph V. Ardizzone*

16:15 Global Soil Moisture Estimation from L-Band Satellite Data: the Impact of Radiative Transfer Modeling in Assimilation and Retrieval Systems (invited)  
*Gabrielle De Lannoy, Rolf Reichle, Alexander Gruber, Jan Quets, Jasper Vrugt and Jean-Pierre Wigneron*

16:45 TerrSysMP-DART Interface: An Integrated data assimilation platform for coupled atmosphere, land surface and groundwater model  
*Prabhakar Shrestha, Timothy Hoar, Jeffrey Anderson, Wolfgang Kurtz, Harrie-Jan Hendricks Franssen, Fabian Gasper, Bernd Schalge, Mauro Sulis, Stefan Kollet and Clemens Simmer*

17:00 The data assimilation framework TERRSYSMP-PDAF  
*Harrie-Jan Hendricks Franssen, Wolfgang Kurtz, Hongjuan Zhang, Dorina Baatz, Sebastian Gebler, Stefan Kollet and Harry Vereecken*

17:15 Bayesian Inverse Problems for radar observation of drop-size distributions  
*Christian Rieger*

17:30 Use and challenges of geophysics to study processes in agro-ecosystems (invited)  
*Sarah Garré, Mathieu Javaux, Gael Dumont, Nolwenn Lesparre, Thomas Hermans and Frederic Nguyen*

19:00 Conference diner (Landesmuseum)

## Modelling Assimilation HPC

## Friday

9:00 Validation of spring wheat responses to elevated CO<sub>2</sub>, irrigation, and nitrogen fertilization in the Community Land Model 4.5 (invited)  
*Yaqiong Lu and Bruce A. Kimball*

9:30 Quantification of root length density at the field scale with electrical impedance tomography: a numerical study  
*Shari van Treeck, Andreas Kemna, Maximilian Weigand and Johan Alexander Huisman*

9:45 Ground-based quantitative electromagnetic induction measurements and inversions show that patterns in airborne hyperspectral data are caused by subsoil structures  
*Christian von Hebel, Maria Matveeva, Elizabeth Verweij, Uwe Rascher, Patrick Rademske, Cosimo Brogi, Manuela Sarah Kaufmann, Achim Mester, Harry Vereecken and Jan van der Kruk*

10:00 Large-scale subsurface characterization using Multi-Configuration EMI and image classification  
*Cosimo Brogi, Johan Alexander Huisman, Lutz Weihermüller, Stefan Pätzold, Christian von Hebel, Jan van der Kruk and Harry Vereecken*

10:15 Simultaneous non-invasive measurement of soil moisture and biomass dynamics using the cosmic-ray neutron probe  
*Heye R. Bogen, Jannis Jakobi, Johan A. Huisman and Harry Vereecken*

10:30 Break

11:15 The temperature sensitivity (Q<sub>10</sub>) of soil respiration: controlling factors and spatial prediction at regional scale based on environmental soil classes  
*Nele Meyer, Gerhard Welp and Wulf Amelung*

## Monitoring Patterns

11:30 Linking spatial and temporal sun-induced fluorescence patterns to soil and atmospheric properties in a heterogeneous agriculture landscape  
*Maria Matveeva, Christian von Hebel, Vera Krieger, Tobias Marke, Patrick Rademske, Alexander Damm, Sergio Cogliati, Cosimo Brogi, Guido Waldhoff, Jan van der Kruk, Susanne Crewell and Uwe Rascher*

11:45 Empirical Derivation of Soil Moisture and Vegetation Parameters from Sentinel-1 SAR in the Rur catchment  
*Sabrina Esch, Wolfgang Korres, Tim G. Reichenau and Karl Schneider*

12:00 Severe Hail Detection: Hydrometeor Classification for Polarimetric C-band Radars Using Fuzzy-Logic and T-matrix Scattering Simulations  
*Mari L. Schmidt, Silke Trömel, Alexander Ryzhkov and Clemens Simmer*

12:15 Effects of parameterizations of the drop size distribution with variable shape parameter on polarimetric radar moments  
*Katharina Schinagl, Christian Rieger, Martin Schneider, Clemens Simmer, Silke Trömel and Petra Friederichs*

12:30 Lunch

13:30 Assessing the Applicability of CHELSA (Climatologies at High resolution for the Earth's Land Surface Areas) data for Monthly and Seasonal Precipitation Predictions  
*Arash Malekian and Elaheh Ghasemi*

13:45 Topological pattern analysis of atmospheric boundary layer turbulence  
*Jose Licon, Cedrick Ansorge and Angela Kunoth*

14:00 Recent Progress on Intrinsic Mode Function Representation and Its Applications to Hydrological Data  
*Boqiang Huang and Angela Kunoth*

14:15 Exploring small-scale patterns in a forest soil-vegetation-atmosphere system  
*Inken Rabbal, Burkhard Neuwirth, Heye Bogen and Bernd Diekkrüger*

14:30 Analysis of Soil Moisture Patterns in a Mesoscale Catchment Using Plot to Catchment Scale Datasets  
*Wolfgang Korres, Tim G. Reichenau, Sabrina Esch and Karl Schneider*

14:45 Synthesis/closing session

15:45 End