

Mesoscale Weather Extremes: Theory, Spatial Modeling and Prediction (WEX-MOP)

Initiative: Modellierung und Simulation komplexer Systeme (beendet)

Ausschreibung: Extremereignisse: Modellierung, Analyse und Vorhersage

Bewilligung: 03.02.2011

Laufzeit: 3 Jahre

Projekt-Website: <http://www.wex-mop.uni-bonn.de/>

Mesoscale weather systems, such as convective cells or severe fronts, are responsible for numerous hazardous weather events that are caused by heavy rainfall and/or extreme winds. The physical understanding, modeling and prediction of their characteristics lie at the heart of this interdisciplinary project, in which atmospheric and mathematical scientists join forces with the German Weather Service. The project seeks an improved understanding of energy cascades and physical constraints for the spatial structure of mesoscale extremes. An ensemble copula coupling approach for physically consistent probabilistic forecasts across space, time and weather variables is developed as well as design verification tools for probabilistic forecasts of extreme events. Novel probabilistic models for spatial fields of extremes, as well as methodology and algorithms for conditional simulation are introduced. As an overarching theme, the project contributes to the development of a next-generation mesoscale probabilistic forecast system for extreme weather.

Projektbeteiligte

Priv.-Doz. Dr. Petra Friederichs

Universität Bonn
Meteorologisches Institut und Interdisziplinäres
Zentrum für Komplexe Systeme
Bonn

Prof. Dr. Andreas Hense

Universität Bonn
Meteorologisches Institut
und Interdisziplinäres Zentrum
für Komplexe Systeme
Bonn

Prof. Dr. Tilmann Gneiting

HITS Heidelberger Institut für
Theoretische Studien
Computational Statistics Group
Heidelberg

Dr. Thordis L. Thorarinsdottir

Universität Heidelberg

Fakultät für Mathematik und Informatik

Institut für Angewandte Mathematik

Heidelberg

Prof. Dr. Martin Schlather

Universität Mannheim

Institut für Mathematik

Mannheim