VolkswagenStiftung

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

Initiative: Modellierung und Simulation komplexer Systeme (beendet)

Ausschreibung: Extremereignisse: Modellierung, Analyse und Vorhersage

Bewilligung: 07.07.2014

Laufzeit: 3 Jahre

Projekt-Website: https://www.wex-mop.uni-bonn.de/publications

High-impact extreme weather events, such as heavy rainfall or strong winds are often associated with intensive atmospheric fronts with strong gradients or deep moist convection. These events are governed by mesoscale atmospheric dynamics, operating on horizontal scales ranging from a few to several hundred kilometres. Accurate forecasts of severe weather events are of crucial relevance to society, and require the joint effort of atmospheric and mathematical scientists. This interdisciplinary project works towards an improved prediction framework. New statistical postprocessing methods are applied to correct for biases and imperfect representations of uncertainty in numerical forecasts while retaining the multivariate structure. The second phase of the project aims at the development of a next-generation comprehensive mesoscale predictive system for extreme weather and will further strengthen the connections between the two disciplines. The goal is to expand the general applicability of the statistical postprocessing methodology, to link it with new knowledge of dynamical systems and to further combine this methodology with new approaches related to extreme value theory.

Projektbeteiligte

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Open Access-Publikationen

Coherent evolution of potential vorticity anomalies associated with deep moist convection.
A Mate rn based Gaussian spatial stochastic process to consistently model wind and related variables.
A similarity-based implementation of the Schaake shuffle
Ensemble calibration with preserved correlations: unifying and comparing ensemble copula coupling and member-by-member postprocessing.
Conditionally Max-stable Random Fields based on log Gaussian Cox Processes