



Extreme European winter storms - a new event set approach

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Due to their severe impacts and damages, including the loss of life, the robust assessment of European winter storms is a major scientific and socio-economic task.

A basic concept of this research effort presented here is to incorporate besides observed (real) storms additionally potential (not necessarily real) storms, which could have hit Europe, in an European storm event catalogue. From this event set realistic extreme value statistic parameters could be estimated.

In a first step relevant storm events are identified from the European Centre for Medium-Range Weather Forecasts (ECMWF) reanalysis datasets ERA40 (1958-2002) and ERA-INTERIM (1989-2009). Furthermore the identified events are classified using an adequate storm severity index (SSI). For the enlargement of the sample size for statistical analyses, additional potential storm events simulated by the Ensemble Prediction System (EPS) of ECMWF will be identified and classified. This allows to estimate SSI return periods up to several hundred years.

From the identified and classified storm events in ERA40, ERA-INTERIM and EPS a specific sub-sample will be selected. For the selected events a dynamical atmospheric modeling chain consisting of the operational global and regional numerical weather prediction models (GME and COSMO-EU) of the German Weather Service (DWD) will be applied. In COSMO-EU different dynamical cores as well as different diagnostic schemes for wind gusts will be used to further increase the sample size. The resulting high resolution wind and gust fields form the basis for statistical extreme value analyses, and additionally for the development of a statistical transfer function for wind fields generated by relatively coarse resolution models into high resolution wind and gust fields.

An outline of the project objectives and methods as well as first results will be presented.