

Different Wind Gust Parametrization in Storm Events

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Extreme weather events like winter storms over Europe are of special interest for reinsurers. In particular, the precise knowledge of extreme wind fields allows a more detailed risk-modeling, which in turn has an impact on the calculation of premiums. As a globally active reinsurer, PartnerRE assigned MeteoSwiss with a re-analysis of 100 historical storms over Europe from 1957 onwards.

Two different parametrisations to determine wind gusts are used. Most operational forecast models calculate gusts as a function of the friction velocity and the wind at the lowest model layer. In addition, an alternative approach by Brasseur (2001) using the height of the balance between turbulent kinetic energy and the buoyancy force to determine maximum wind speed of gusts at the ground has been incorporated.

The re-analysis is carried out at the Swiss Center for Scientific Computing (CSCS) with the 'Alpine Model' (aLMo), the operational mesoscale weather forecast model at MeteoSwiss, developed in the frame of COSMO (collaboration of five European national weather services). Data from the ECMWF ERA-40 project provides the necessary initial- and boundary fields. A two-step processing cascade leads from the original 120km ERA-40 resolution to the final result with 7km grid-mesh. Each simulation runs in assimilation-mode where historical weather observations and measurements are exploited to achieve the best possible quality.

Preliminary results and the verification of near-surface wind fields illustrating the maximum wind speed at each location during the active period of a storm will be presented.

Brasseur O., 2001: Mon. Wea. Rev. 129, 5–25