



Wind gust analysis and nowcasting in INCA

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Analysis and short range forecasting of wind and wind gusts still poses a challenge due to their variability on small spatial and short temporal scales. The INCA (Integrated Nowcasting Through Comprehensive Analysis) analysis and nowcasting system deals with mean 10m-wind and wind gust fields both in the analysis and in the forecasting mode. Mean wind fields are derived from surface observations and a model background field. A parameterization of gusts is based on the wind analysis which is combined with a spatially varying gust factor. In the first 2 hours, gust observations are included with decreasing weight. For longer lead times, the observations are smoothly merged into the model fields.

A comparison of different gust parameterizations in INCA reveals that the actual method can hardly be improved as long as no additional meteorological information is included, i.e. parameterizations based on 10m-wind cannot be used very widely, and more sophisticated methods should be employed. New approaches, such as the gust parameterization used in WRF are currently being implemented in INCA and tested for their performance. Besides to the potential benefits due to improved parameterizations, an improved representation of mean wind fields in higher spatial resolution is indispensable. This could be achieved by using highly resolved wind fields which are derived from AROME, or generated through dynamical adaptation. The suggested presentation will give an overview of the INCA wind and gust modules and summarize current research in this field.