Nowcasting with INCA: Scientific developments and operational experiences

Alexander Kann, Benedikt Bica, Clemens Wastl, Martin Suklitsch, and Yong Wang
Central Institute for Meteorology and Geodynamics, Numerical Weather Prediction, Vienna, Austria
(alexander.kann@zamg.ac.at)

The high-resolution analysis and nowcasting system INCA (Integrated Nowcasting through Comprehensive Analysis) provides 3-D hourly fields of temperature, humidity, and wind, and 2-D fields of cloudiness, precipitation rate, and precipitation type at an update frequency of 15 min. The system operates on a horizontal resolution of 1 km and a vertical resolution of 100-200 m. It combines surface station data, remote sensing data (radar, satellite), forecast fields of numerical weather prediction models, and high-resolution topographic data. In the alpine area, the system provides, among others, meteorological input for operational high-resolution flood forecasting and winter road maintenance. INCA employs a new radar/raingauge combination algorithm and includes elevation effects on precipitation using an intensity-dependent parameterization. Current scientific developments focus on the improvement of precipitation nowcasting by simulating convective cell life cycle and on improved parameterizations of wind gusts. Validation results showing the skill of the nowcast compared to NWP will be presented.