En-INCA: Towards an integrated probabilistic nowcasting system

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INCA (Integrated Nowcasting through Comprehensive Analysis), the analysis and nowcasting system operated by ZAMG, is based on blending observations and NWP data. Its performance is extremely high in the nowcasting range. However, uncertainties can be large even in the very short term and limit its practical use. Severe weather conditions are particularly demanding, which is why the quantification of uncertainties and determining probabilities of event occurrences are adding value for various applications.

The Nowcasting Ensemble System En-INCA achieves this by coupling the INCA nowcast with ALADIN-LAEF, the EPS of the local area model ALADIN operated at ZAMG successfully for years already. In En-INCA, the Nowcasting approach of INCA is blended with different EPS members in order to derive an ensemble of forecasts in the nowcasting range. In addition to NWP based uncertainties also specific perturbations with respect to observations, the analysis and nowcasting techniques are discussed, and the influence of learning from errors in previous nowcasts is shown.

En-INCA is a link between INCA and ALADIN-LAEF by merging the advantages of both systems: observation based nowcasting at very high resolution on the one hand and the uncertainty estimation of a state-of-the-art LAM-EPS on the other hand. Probabilistic nowcasting products can support various end users, e.g. civil protection agencies and power industry, to optimize their decision making process.