



## Precipitation output of INCA system: evaluation and use

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INCA is a system that provides detailed analysis of current weather and improves NWP forecasts by using latest information from meteorological stations, radars, sounding and satellite data. It was developed by the Zentralanstalt für Meteorologie und Geodynamik in Austria and provided for use by other countries. The Czech Hydrometeorological Institute (CHMI) uses adapted version of the INCA system (INCA-CZ) in the frame of INCA-CE project. This contribution presents the first results of use of INCA-CZ precipitation module for quantitative precipitation analysis (QPE) and forecast (QPF) and their comparison with the algorithms currently used by the CHMI. Testing of the INCA-CZ precipitation output is focused on QPE and QPF up to 3 hours, since INCA is tested and used as an input into hydrological model for flash flood forecasting.

INCA-CZ QPE was compared with algorithms used by the CHMI for QPE (based on conditional merging (CM) and on kriging with external drift (KED)). The comparison was carried out on 10 minute and 1 hour precipitation data. Generally 10 minute precipitation sums are burdened by higher uncertainties than 1 hour precipitation data, still they are very useful when used in convective situations and when we try to forecast highly localized flash floods. Preliminary results suggest that INCA-CZ QPE is comparable with QPEs used by the CHMI. As expected, the performance of the algorithms when using 10 minute data is generally worse than for 1 hour precipitation sums.

INCA-CZ QPF was compared with the QPF made by the CHMI implementation of the COTREC algorithm. COTREC algorithm is operatively applied on the CHMI radar data. 1 hour QPEs computed by KED algorithm and INCA-CZ were used as the true values. QPFs of average 1hour precipitation sums computed over 119 operative catchments were compared. The forecasted sums were computed over 0-1, 1-2, 2-3 hour. Quality indices CSI, FAR and POD for 0.1mm and 1.0mm thresholds were used. CSI values of both INCA and COTREC QPFs are comparable. More thorough testing on a larger sample of data will be necessary.

Finally, INCA-CZ QPF served as an alternative input into hydrological model HYDROG used by the CHMI. INCA QPF was tested on several flash flood cases and compared with other QPF methods.