



Automated short-term forecasting system MeteoExpert

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Nowcasting and short-term forecasting of fog, low clouds and precipitation is a key issue which can have a large scientific and practical effect. Accurate and timely nowcasts is a basis of early warning automated system providing information about low visibility, low clouds, heavy precipitation and other dangerous weather conditions for decision-makers. Interactions between land surface and adjacent layers of the atmosphere are not well parameterized in current operational NWP models. A methodology based on local observations, an adaptive assimilation scheme and a local 1-D numerical model is tested with reference to five Olympic Sochi-2014 venues. High resolution data from automatic weather stations and Doppler weather radar are used. A real-time radar data – based algorithm has been developed to detect and nowcast precipitation at spatial resolution of 2 km and temporal resolution of 10 min. A combination of three methods is employed to estimate precipitation movement (a cross-correlation tracking method, averaged Doppler velocity, and prognostic wind at fixed levels - 700 hPa, 500 hPa and 300 hPa). The system has capabilities to generate pointwise time series of meteorological parameters for 4 hours ahead and update every 10 minutes automatically. Forecasts of air temperature, dew point temperature, wind velocity, ceiling, and visibility have been verified against the weather stations data. The system MeteoExpert is expected to be tested during the next Olympic Games in a framework of the FROST-2014 project.