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Observational error correlation model for radar reflectivity

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All modern data assimilation techniques use a priori information on error covariance structures estimated from the background and the observation vectors. As a preparatory step to the direct assimilation of the radar reflecivity we concentrated on the estimation of the observational error statistics using radar reflectivity data from Baltex Radar Data Centre (BRDC). Composites from 36 radars available in the catchment were used. This data set has the high spatial (2 km) and temporal (15 min) resolution. The full observation error is a sum of two components: an instrumentation error and a representativeness error. We suppose that unbiased observations measure the mean of physical process and have a total observation error that includes both the representativeness error and the instrumental error. The collected data were preprocessed to eliminate pixels with weak signal to noise ratio. Finally echoes having reflectivity greater than 10 dBZ for ranges < 50 km were used. This subset includes most clear air values and all precipitation values. Ater some statistical assumptions on the error process our main task was to estimate in parametric form the spatial error covariance structure. Without distributional assumptions, we focussed on sample variogram fitting method used in geostatistics, mainly because this approach deals with correlated processes. Details of the method used and results based on two year sample will be reported in our presentation.

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