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On spatial structures and accumulation characteristics of radar-based precipitation in North-East Carpathians

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Recent floods on the Tisza river drew attention to the importance of detailed rainfall patterns. Real-time information about it can be gained only from calibrated digital radar images. Hydrological risks simulating flood modelling can perform successfully only in case if a simulation of the rainfall patterns are provided. Modelling the statistical structure of rainfall patterns, 12 hours calibrated rainfall fields have been used of the radar station at Nyíregyháza, Hungary for the period 1993-2002. Within the key area a 170x170 km square has been defined, in which the rainfall patterns are described in 1x1 km resolution. The region has been selected according to the hydrological goal and to technical limitations of the rainfall estimation. The method applied to calculate precipitation amounts from radar intensity is a Hungary-specific adaptation of the method, developed and applied by the Finnish Meteorological Institute (*Michelson et al.*, 2000; *Michelson and Koistinen*, 2000). Simulation of 12 hours precipitation data is expected to reflect properly the real risk of critical space-time coincidence of precipitation on the catchment area at the examined region. The basis of the simulation is a common allotment of 3+1 possible states (immense, medium, little and dry) of three consecutive area mean precipitation values , what is a generalisation of a precipitation-state simulation of the point-wise weather generators. Initial results of the research are reported. The two key conclusions by now are: (i) The 170x170 km area is too small to identify clearly developed patterns. (ii) The area mean precipitation types, however, have at least 2 x 12 hours of local memory which help in simulating better series than the random selection.