Use of radar-based QPE in stochastic precipitation simulator for flood frequency estimation over small mountain catchments

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Results of the event oriented precipitation analysis are presented for several small mountain catchments in the border region of the Czech Republic - the Jizera Mountains. In this area the annual precipitation about 1500 mm/year represents more than a double of the mean annual precipitation over the Czech Republic and the historic Czech maximum daily amount of 345 mm was recorded there in July 1897. 23 larger floods were recorded there in the period 1846-1958 and the floods from 1997, 2002, 2006, 2010, and 2013 were documented in details. Input precipitation data consist of hourly rainfalls determined from MERGE product (operational product of the Czech hydro-meteorological institute - CHMI) which merges ground precipitation reported by Czech operational rain-gauge stations and rough radar precipitation. The MERGE data cover the Czech territory by rainfall values in 1km × 1km grids and they are available for summer periods 2005-2013. In the poster we show the results of the event oriented analysis for event duration, mean and maximum rainfall intensity, and inter-storm period. These are the parameters of the precipitation simulator used in the present hydrological flood frequency estimation. Moreover, the events are stratified by the antecedent precipitation index and the synoptic pattern. We present first results of using the parameters of stochastic precipitation simulator in semi-distributed model of catchment hydrology (TOPMODEL) with the application of GLUE (Generalized Likelihood Uncertainty Estimation) methodology in order to simulate asymptotic flood frequency estimation.