Radar-based precipitation climatology of the Czech Republic in the warm part of the year

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High resolution quantitative precipitation estimation (QPE) represent a powerful tool for various climatological studies, especially those focused on analysis of precipitation extremes connected with climate change. The study will present climatological analysis of precipitation totals accumulated over the warm part (May-September) of the years 2002-2011 on the area of the Czech Republic (CR). The rain rates were calculated using radar reflectivity data at 2 km above sea level (CAPPI 2 km) estimated from weather radar measurements performed by two Czech C-band Doppler radars (Brdy, Skalky) every 5 (since June 2009 onwards) and 10 minutes in 1 km by 1 km square boxes over the whole area of the CR. Radar-derived daily precipitation was merged with daily rain gauge measurements and resultant adjusted daily sums of precipitation were divided into 10 minutes precipitation in the ratio of 10 minutes radar-derived precipitation.

With respect to the spatial distribution a frequency of precipitation for given thresholds will be calculated in every pixel. The accumulation and average of adjusted radar-derived precipitation and interpolated precipitation measured by rain gauges will be compared and their difference will be expressed by various verification techniques (e.g., RMSE, BIAS, etc.). Besides precipitation totals accumulated over longer period, attention will be also paid to the analysis of extreme sub-daily precipitation events due to their high variability in space and time. Small-scale differences of precipitation totals accumulated over different time scales in areas with large elevation gradient, such as northwest part of the CR, will be studied and quantified. The differences will be demonstrated on one selected case with heavy precipitation.