



The exploitation of Convective Rainfall Rate algorithm from SAF NWC for the area of the Czech Republic

Vojtech Bliznak (1,2) and Zbynek Sokol (1)

(1) Institute of Atmospheric Physics, Department of Meteorology, Prague, Czech Republic (bliznak@ufa.cas.cz), (2) Charles University in Prague, Faculty of Science, Department of Physical Geography and Geoecology, Prague, Czech Republic

The SAFNWC (Satellite Application Facility on Support to Nowcasting and Very Short Range Forecasting) is a tool for deriving and developing products focused on nowcasting and very short range forecasting based on satellite data from MSG (Meteosat Second Generation). 12 algorithms have been developed focusing on detection of cloud types and air masses as well as in order to obtain satellite precipitation estimates (SPE).

This study deals with CRR (Convective Rainfall Rate) algorithm which computes instantaneous rain rates and SPE from convective clouds (SAF NWC, 2009a). The CRR uses 2-D and 3-D calibration matrices (depending on daytime) which were calibrated with the Spanish and Baltic radar data for latitudes lower than 45° N and higher than 55° N, respectively. For latitudes between 45° N and 55° N, which is the area of the CR, the algorithm computes a linear regression between these two calibration matrices and therefore resulting SPE are not as accurate as in the validation report over Spain (SAF NWC, 2009b).

The main goal of this paper is to develop different types of calibration matrices over the area of the Czech Republic and to compare them with the original one. Data from MSG with temporal and horizontal resolutions of 15 minutes and circa 4 x 6 km, respectively, from summer months (June to August) of the years from 2006 to 2008 are used for this purpose. The calibration process is done using radar-derived rainfall estimates that were measured by two Czech C-band weather radars and that were merged with records from rain gauge stations. The obtained calibration matrices differ from the original one. The accuracy of SPE based on the new matrices is validated. The influence of advection flow and time displacement will be also part of the study.

References:

SAFNWC, 2009a. Algorithm Theoretical Basis Document for “Convective Rainfall Rate” (CRR - PGE05 v3.0).

SAFNWC, 2009b. Validation report for “Convective Rainfall Rate” (CRR-PGE05 v3.0).