



## **Adaptation and verification of the DBCRAS numerical weather prediction model in Hungary**

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The Eötvös Loránd University (Hungary) operates a polar orbiting satellite receiving station in Budapest (47.475°N, 19.062°E, 40 m ASL) since 2002. This station receives Earth observation data from polar orbiting satellites including MODerate resolution Imaging Spectroradiometer (MODIS) Direct Broadcast (DB) data stream from satellites Terra and Aqua.

The received DB MODIS data are automatically processed using freely distributed software packages. As the first step, after every Terra/Aqua overpass the processing chain begins with creating geolocated and calibrated radiances from the raw data stream using the MODIS Level1DB software of the SeaDAS group. The preprocessed data of the infrared bands are then destriped removing artificial stripes. In order to retrieve atmospheric properties from these Level 1B data we use the MODIS Level2 part of the International MODIS/AIRS Processing Package (IMAPP). These atmospheric, near-real time Level2 products are assimilated twice a day (at 00 and 12 UTC) by the Direct Broadcast CIMSS Regional Assimilation System (DBCRAS) numerical weather prediction software and by its nested version (NDBCRAS). The DBCRAS and NDBCRAS models calculate 72 and 48 hours long weather forecasts with 48 and 16 km horizontal resolution, respectively. DBCRAS is operational at the University since 2009 which means that by now sufficient data is available for the verification of the model.

In the present work verification results are presented for DBCRAS based on station measurements in Hungary and also utilizing upper air analysis data from the European Centre for Medium-Range Weather Forecasts (ECMWF). Numerical indices are calculated to quantify the performance of DBCRAS. During a limited time period DBCRAS was also ran without assimilating MODIS products which means that there is possibility to quantify the effect of assimilating MODIS physical products on the quality of the forecasts. For this limited time period verification indices are compared to decide whether MODIS data improves forecast quality or not. Station data is also used to verify the operative deterministic model of ECMWF and the calculated indices are compared with those derived using DBCRAS data.