



Estimation of vertically integrated water vapor in Hungary using NOAA AVHRR and MODIS imagery

A. Kern (1), J. Bartholy (1), É. Borbás (2), Z. Barcza (1), Gy. Gelybó (1), R. Pongrácz (1), and Cs. Ferencz (3)

(1) Eötvös Loránd University, Department of Meteorology, Budapest, Hungary, (2) Space Science and Engineering Center, University of Wisconsin - Madison, USA, (3) Eötvös Loránd University, Space Research Group, Budapest, Hungary, (anikoc@nimbus.elte.hu / Phone: +36-1-372-2904)

There is a growing need in the meteorologist community for high spatial and temporal resolution atmospheric water vapor data. This data is estimated in several places worldwide using the signal of the GPS (Global Positional System) satellites, measured in a network of ground-based meteorological stations and also in a sparse network of radiosondes. Remote sensing provides an alternative method to estimate the water vapor content of the atmosphere in high spatial resolution. Many techniques have been proposed to estimate atmospheric water vapor content using satellite data, primarily in the form of total column precipitable water, using a variety of electromagnetic spectrum. This data is essential to understand the hydrological cycle, aerosol properties, aerosol-cloud interactions, energy budget, the greenhouse effect and the climate system.

In this poster we discuss the possibility to estimate the vertically integrated water vapor in Hungary (located in Central/Eastern Europe) using remote sensing data. We also present one of the applications of this kind of data, an atmospheric correction algorithm, the so called SMAC method (Simplified Method for the Atmospheric Correction). To the researches we apply the data of the Advanced Very High Resolution Radiometer (AVHRR) onboard the NOAA meteorological satellites and Moderate Resolution Imaging Spectroradiometer (MODIS) onboard the satellites Terra and Aqua. This research activity is based on the data acquired by the HRPT/MODIS receiving station established in Budapest by the Space Research Group. This kind of satellite receiving station is unique in the region of the Carpathian Basin.

In our investigations we have compared the estimated integrated water vapor data of the different algorithms using AVHRR radiances, the estimated integrated water vapor data based on MODIS measurements (using the MOD 05 and MOD 07 products) with the ECMWF vertically integrated total water content archived forecast data for the region of Hungary. We also applied some sounding measurements such as the radiosondes. The poster presents the current state of the research and the new developments.