Geophysical Research Abstracts, Vol. 9, 03052, 2007
SRef-ID:

Validation of cloud liquid water path retrievals from SEVIRI using one year of CloudNET observations

R. A. Roebeling, H. M. Deneke and A. J. Feijt

Royal Netherlands Meteorological Institute (KNMI), The Netherlands(rob.roebeling@knmi.nl /phone +31-30-2206554)

The accuracy and precision are determined of cloud liquid water path (LWP) retrievals from the Spinning Enhanced Visible and Infrared Imager (SEVIRI) onboard METEOSAT-8 using one-year of LWP retrievals from microwave radiometer (MWR) measurements of two CloudNET stations in Northern Europe. The MWR retrievals of LWP have a precision that is superior to current satellite remote sensing techniques, which commends them appropriate validation data. The Cloud Physical Properties (CPP) algorithm of the Satellite Application Facility on Climate Monitoring (CM-SAF) is used to retrieve LWP from SEVIRI reflectances at 0.6 and 1.6 micron.

The accuracy and precision of the LWP retrievals from SEVIRI show large differences between summer and winter. During summer, the instantaneous LWP retrievals from SEVIRI agree well with those from the MWRs. The accuracy is better than 5 g $m^{-2}$and the precision is better than 30 g m^{-2}, which is similar to the precision of LWP retrievals from MWR. The added value of the 15-minute sampling frequency of METEOSAT-8 becomes evident in the validation of the daily median and diurnal variations in LWP retrievals from SEVIRI. The daily median LWP values from SEVIRI and MWR are highly correlated (corr. $>$ 0.95) and have a precision better than 15 g m^{-2}. In addition, SEVIRI and MWR reveal similar diurnal variations in retrieved LWP values. The peak LWP values occur around noon. During winter, SEVIRI generally overestimates the instantaneous LWP values from MWR, the accuracy drops to about 10 g $m^{-2}$and the precision to about 30 g m^{-2}. The most likely reason for these lower accuracies is the shortcoming of CPP and similar one-dimensional retrieval algorithms to model in-homogeneous clouds. It is suggested that neglecting cloud in-homogeneities leads to a significant overestimation of LWP retrievals from SEVIRI during winter over Northern Europe.