Geophysical Research Abstracts
Vol. 12, EGU2010-13076, 2010
EGU General Assembly 2010

Developent and application of a MSG/SEVIRI simulator for cliate odel evaluation

Bastiaan Jonkheid, Rob Roebeling, and Erik Van Meijgaard
KNMI, De Bilt, the Netherlands (jonkheid@knmi.nl)

A simulator for MSG/SEVIRI observations of Western Europe is presented. The simulator ingests condensate content and particle size profiles for water and ice clouds from a climate model, the KNMI Regional Atmospheric Climate Model (RACMO) in this study, which are translated to reflectances of the 0.6 and 1.6 micron SEVIRI channels. These reflectances are used to evaluate uncertainties in Cloud Optical Thickness (COT), Cloud Thermodynamic Phase (CPH) and particle effective radius retrievals that are based the Nakajima-King (1990) approach. In our study the Cloud Physical Properties (CPP) algorithm of the Climate Monitoring SAF of EUMETSAT is used for this purpose.

The objective of the study is twofold. First, by comparing the Condensed Water Path (CWP) of the climate model to the retrieved CWP, one can probe the CPP algorithm for the uncertainties it contains in realistic circumstances; removal of these uncertainties will greatly improve the usefulness of CPP retrievals for the evaluation of Climate models. Second, one can compare RACMO simulations against SEVIRI observations both at the level of radiances (via the simulator), and at the level of cloud properties (via the CPP algorithm). The ultimate goal is to use SEVIRI observations to improve the behavior of clouds in RACMO.

In our presentation we will show the first results of the MSG/SEVIRI simulator, using RACMO output for May 2009 over Europe. It will be shown that the retrieval uncertainties are generally small for single phase clouds. The COT retrieval tends to become more uncertain in case the cloud profiles have a very large COT value, or the profiles comprise both water and ice clouds. Conversely, the effective particle radius retrieval becomes more uncertain at very small COT values.