



Study of Cloud Droplet Radius and Cloud Optical Thickness in “Warm” Clouds Using Satellite Data

Cristinel Grigoraș and Sabina Ștefan

University of Bucharest, Faculty of Physics, Bucharest, Romania (grigoras.cristinel@gmail.com)

The present study is focused on the analysis of the cloud microphysical properties using two very important parameters which characterize the liquid water clouds: the cloud droplet radius and the cloud optical thickness. It is known that the knowledge of the variations of these parameters can provide valuable information on most microphysical processes in clouds. Therefore, the correlation between these parameters has been carefully considered. Satellite data from the MODIS 06 system has been analyzed first, for four years time span (2008-2011) and then for the summer's months of the years 2010 and 2011. The data collected from three stations was used to analyze the dependence between the two parameters: a continental station (in Magurele, Ilfov, lat 44.34, lon 26.03), a coastal station (Eforie Nord, Constanța, lat 44.07, lon 28.63) and a maritime station (Gloria, lat 44.6, lon 29.36), all from Romania. The relationship between the cloud droplet radii and the cloud optical thicknesses obtained processing satellite data for the four years between 2008 and 2011 shows a good correlation (correlation coefficient 0.54). The ensuing relationship between the two parameters could be used for cloud microphysics studies. The analysis of dependence between cloud droplet radii and cloud optical thickness from satellite data during summer confirms the presence of their positive correlation. But contrary of the expectations, the analysis shows very small differences between the results found out for the three different locations.