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Cloud fraction and cloud radiative properties in Magurele, Romania

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The present study exposes research on the most important features of temporal variability of cloudiness in the Magurele area (44.35N; 26.03E) in Romania, during 2008 and 2011, using satellite cloud data retrieved from MODIS, in conjunction with ceilometer cloud data. The ceilometer CL-31, located in Magurele, is a continuously-measuring equipment. It makes possible the storage of a large amount of data that can give useful information about cloud types and their altitude, which are very important in modeling radiative transfer, for instance. We have analyzed and compared seasonal variations in cloud fractions and the frequency of different types of clouds, using both data sets. The differences between satellite and ceilometer data were small, and Stratocumulus clouds were found to have been dominant during winter. In addition, the albedo values of clouds were computed, for the low-level and mid-level clouds in winter and summer days, and then compared using the two data sets. The radiative forcing for the low-level, mid-level and high-altitude clouds was also analyzed, derived from satellite data. The results show negative values for low- and mid-level clouds (mean values of -20Wm-2 for the winter of 2008-2009) and positive values for Cirrus clouds ($\sim$80 Wm-2 the same winter).