



Study of fog and low clouds using ceilometer and microwave radiometer data at Magurele, Romania

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This work is dedicated on investigation of the potential use of active and passive remote sensing techniques to determine the presence of fog and low clouds in specifically meteorological conditions. The fog and low clouds were detected using ceilometer located at Magurele(44.35 N, 26.03 E) and lidar from satellite platform. The microwave radiometer, also located at Magurele, was used as complementary equipment. Ceilometer is an active remote sensing equipment that determines the height of the cloud base that could be also used to measure the aerosol concentration within the atmosphere and the fog layers present within 1000m above the ground. The ceilometer data can reach a 10m vertical resolution with a minimum temporal resolution of 16s and can cover a range up to 7500 m altitude. For the retrieval of temperature and humidity profiles a ground based Passive Microwave Radiometer System (PMRS) was used. The system uses passive microwave detection in the 22.335 to 31.4 GHz (M1) and 51 to 58 GHz (M2) detection bands. The vertical profiles of temperature and relative humidity up to 10km with a temporal resolution of several minutes can be obtained. This paper focuses on a study for 2 month: from December 1, 2011 to January 31, 2012. This wintertime period was selected because continuous measurements were performed and it was characterized by several low stratus clouds and fog episodes. The study showed that the combination of ceilometer and radiometer has the potential to provide the same information for the periods when low stratus clouds and fog episodes occur. The study also showed a good agreement between the data from these equipments and satellite data for clouds.