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# Fog analysis using remote sensing and in situ data in a suburban area, Romania

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In contrast to severe and high-impact meteorological events, fog is by its nature a small-scale, often short-lived phenomenon that does not lend itself as easily to identification and prediction that reduces horizontal visibility to less than 1000 m. In most of the cases, fog appears in an environment with large concentrations of aerosols and values of relative humidity values close to 100%. Fog formation and dissipation involve droplet formation, activation and diffusion. This paper objective is to characterize fog formation, evolution, and dissipation using a suite of remote sensing instruments - Ceilometer Vaisala CL 31 and HATPRO Microwave Radiometer and in situ measurements -Aerosol Mass Spectrometer (AMS). The AMS high time resolution measurement offers the baseline for proper characterization of submicron nonrefractory particles emphasizing the chemical composition and processes that can lead to secondary aerosol formation. The present study analyzes the fog formation during January and February 2013 in Magurele, Romania (26.029E, 44.348N, ASL: 93m) 6km south of Bucharest. The results showed that the main type of fog in this area is radiation fog, being characterized by the presence of oxidized organic fragments. The size distribution during the investigated period shows similar diameter for ammonia and nitrate that are assumed to be internally mixed due to favorable conditions like low temperatures and high relative humidity. The presence of ammonia sulfate is highlighted also for short periods, the photochemical processes facilitating gas to aerosol transformation of $SO_2$.