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Visibility assesment using remote sensing data

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Severe weather events like fog have a high impact on all kinds of traffic operations. During the last decade was proven the capability of remote sensing equipments to detect fog cases in terms of duration, occurrence and dissipation. Therefore, in this study the data from Väïsälä CL31 ceilometer and Raman Depolarization Lidar installed at Magurele, Romania (44.35 N, 26.03 E) were used. The backscatter coefficient from Ceilometer and extinction coefficient and different lidar ratios (LR) values from Lidar were used in order to determine horizontal visibility during the fog events in Magurele area. Ceilometer backscatter coefficient profiles are obtained with a time resolution of 16 s and up to 7.5 km altitude. . A neural network algorithm was used to calculate the lidar ratio values for different aerosol types and also for different relative humidity. Thus, for continental aerosol the LR value is 58srad, for continental polluted is 60srad and for smoke LR is 55srad. The average visibility computed for radiation fog , dominant type (57 cases) occurring in Magurele, during 2012-2014 was 50m. An important result is that the dependence of horizontal visibility for radiation fog at Magurele on LR is insignificant. This means that radiation, meteorological and geographical factors influence fog generation more much than aerosol type.