



The 7-13 September extreme dust downfall over the East Mediterranean A two ceilometers study

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On September 7 2015, an unprecedented huge dust plume approached the SE Mediterranean basin from the north-east. According to the Israeli Meteorological Service, it is the first time in 75 years of measurements, that a dust storm reaches Israel early September, lasts beyond one day (7-8 d) and the dust concentrations reach values 100 times the normal ($1700\mu\text{g}/\text{m}^3$). Dust storms are normally monitored in the East Mediterranean using satellites and surface PM data. Obviously, these cannot show the vertical evolution of the dust including penetration, sinking and cleaning since the observed vertical profiles are normally not available. Two micro LIDAR ceilometers, one onshore (Hadera) and the other 7km inland (Bet-Dagan), were employed. High-resolution, vertical profiles of aerosols and clouds, with 10m resolution, every 16s, are analyzed. The 1000m altitude dust penetration, sinking into the 250-500m complex structured mixed layer and lastly the gradual elevated cleaning after 7 days, are presented in both ceilometer sites. The continuously measured dust downfall from September 7th evening to the 8th noon can be utilized in the future as an operational tool for airport and civil early warning. The entire 7 days duration as compared to only 100 hours based on traditional detectors, is investigated.