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Dust storm from Syria- a potential new aerosol source in the E. Mediterranean- A ceilometer and synoptic study

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On 7 Sep 2015 an unprecedented huge dust plume approached the SE Mediterranean basin from the northeast-Syria region. 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 several days and dust concentrations reach values 100 times the normal (1700μg/m3). 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 vertical profiles are not available. High-resolution, micro Lidar Ceilometer network is gradually established in Israel. A few instruments of this network were already operational during the dust storm. The most crucial vertical information, monitored by these Ceilometers with 10m resolution vertically, every 16s, is analyzed. The difference in the cloud-layers allow the investigation of the high altitude of 1000m dust penetration, its sinking into the complex structured 250-500m mixed layer and the gradual 3D cleaning. This finding contradicts the conventional understanding that cleaning is due to gradual descent and shows not only the vertical fluctuation during the entire event but also the vertical rise to 2000m at the end of the event. The vertical information showed that the actual event period duration was 7 days, compared to only 90 hours based on traditional detectors. Is it a new dust source in the E. Mediterranean-long and short term trends?