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Spatial and Temporal Variation in Dust Deposition Rate in Isfahan and its Relationship with Selected Climatic Parameters

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Abstract

Spatial and temporal distribution of dust deposition rate (DDR) in Isfahan city and the influencing climatic parameters were studied. Dust samples were collected using glass trays placed on the roof of one-story buildings from 20 sites in Isfahan city for 12 months. Climatic data were obtained from Meteorological Organization and analyzed. The highest and the lowest amount of DDR in agreement with the direction of prevailing wind were observed for dry months with eastern and northeastern wind directions and wet periods with western and southwestern wind directions, respectively. This can indicate dust emission from the desert located in eastern part of Isfahan city. Statistically significant inverse correlation between DDR and precipitation and relative humidity, and significant and positive correlation of DDR with Min and Max temperatures in all the studied months and also with Max and average wind speed for dry sampling months may well justify the temporal distribution of DDR in the city. In dry months, finer particles from eastern desert can be transported a longer distance and deposited in the western part of the city, far from the source area. In wet seasons, however, soil aggregates become coarser as a result of particle adhesion. This, in turn, results in the deposition of dust near the source area as the transporting power of dust reduces.

Keywords: Atmospheric aerosols deposition, temporal variability, spatial distribution, climatic parameters.

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