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Spatial and Temporal Monitoring of Aerosol over Selected Urban Areas in Egypt

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We utilize remote sensing data of atmospheric aerosols from the Moderate Resolution Imaging Spectroradiometer (MODIS) aboard the Terra and Aqua satellites to explore spatio-temporal patterns over selected urban sites in Egypt during 2000-2015. High resolution (10 x 10 km2) Level 2, collection 5, quality-controlled product was used. The selected sites are characterized by different human and industrial activities as well as landscape and meteorological attributes. These have impacts on the dominant types and intensity of aerosols. Aerosol robotic network (AERONET) data were used to validate the calculations from MODIS. The suitability of the MODIS product in terms of spatial and temporal coverage as well as accuracy and robustness has been established. Seasonal patterns of aerosol concentration are identified and compared between the sites. Spatial gradient of aerosol is assessed in the vicinity of major aerosol-emission sites (e.g. Cairo) to determine the range of influence of the generated pollution. Peak aerosol concentrations are explained in terms of meteorological events and land cover. The limited trends found in the temporal records of the aerosol measurements will be confirmed using calibrated long-term ground observations. The study has been conducted under the PEER 2-239 research project titled “The Impact of Biogenic and Anthropogenic Atmospheric Aerosols to Climate in Egypt”. Project website is CleanAirEgypt.org