



Analyzing the influence of the Nile Delta major pollution episode during autumn time

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We have analyzed aerosol and cloud properties, obtained from the Moderate Resolution Imaging Spectroradiometer (MODIS) data, over Cairo and other cities within the Greater Delta region during the fall months, September, October, November (SON), 2000 - 2006. During these time periods, we have examined dense haze and smog like phenomenon known, locally, as the “black cloud”. Our work is based on studying the Aerosol Optical Depth (AOD), Cloud Top Pressure (CTP), Atmospheric InfraRed Sounder (AIRS) and Tropospheric Emission Spectrometer (TES) temperature profiles, and Water Vapor Column (WVC) over different locations under investigation. Anomalous water vapor is detected which we believe is as a result of pollution aerosols acting as cloud condensation nuclei (CCN). A varying increasing trend of WVC over the different locations is observed owing to the possibility of long-term climate effects of urban pollution. Temperature inversion conditions as well as adverse weather conditions contribute to the pollution observed through preventing pollutants from escaping to higher atmosphere. We use the HYSPLIT_4 model for computing trajectories over Cairo and hence supporting our investigation of the regional presence of this pollution episode over the Delta. We also study the varying total ozone column trends over Cairo using satellite measurements obtained from Total Ozone Mapping Spectrometer (TOMS) on board Nimbus-7 (1978-1993) and Earth Probe (EP) (1996-2005) missions and the Ozone Mapping Instrument (OMI) on board the Aura mission (2004-present). A clear declining trend in the last 10 years is observed over Cairo matching the well

known pollution outbreak that started on 1999 named locally as the black cloud.