



Weekly cycles of aerosol and cloud parameters observed with the TERRA and AQUA MODIS global datasets

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Recently, the interest of the scientific community in the weekly cycle of air pollution, meteorological and climatic parameters has been rejuvenated. Since, no weekly cycles exist in nature, any weekly effect is strictly anthropogenic, caused by human activities and working cycle. This phenomenon is investigated here on a global scale using aerosol and cloud satellite data from the Moderate Resolution Imaging Spectroradiometer (MODIS) instruments aboard EOS-TERRA and EOS-AQUA. The two daily gridded datasets spanning from 2000 to 2009 (MOD08_D3 for TERRA) and 2002 to 2008 (MYD08_D3 for AQUA) are used for the investigation of the existence of weekly cycles of several atmospheric parameters with a 1x1 degree resolution. A total of eight aerosol parameters, including aerosol optical depth and aerosol fine mode fraction at 550nm, are investigated here. With the use of aerosol masks to eliminate the influence of non-urban aerosols (dust and/or marine aerosols) and a set of tests to investigate the statistical significance of the weekly patterns, the weekly cycle of aerosols is studied. A set of cloud optical parameters, including cloud optical depth and cloud fraction, is examined using the same methodology in order to find possible connections between aerosols and clouds which manifest the aerosol indirect effect. Finally, the results from the two separately analyzed datasets are compared.