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Satellite retrievals of AOD and NO_2 concentration during the Pegasos campaigns

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As part of the The Pan-European Gas-AeroSOls-climate interaction Study (PEGASOS), aerosol and trace gas measurements were made from a Zeppelin flying in the atmospheric layers close to ground over the Benelux area and Po Valley in Italy during late spring and summer 2012. The mission was complemented with ground based and satellite observations. In this work we present an analysis of the Aerosol Optical Depth (AOD) observations from the MOderate Resolution Imaging Spectroradiometer (MODIS) satellite instrument and NO_2 data from the Ozone Monitoring Instrument (OMI). This information is used to interpret the AOD and NO_2 distributions in terms of sources of anthropogenic aerosols due to combustion of fossil fuels and biomass burning, as well as sources of biogenic aerosols such as microbial production from soil, wildfires, and lightning. The satellite data show a large AOD in both the Benelux area and the Po Valley, whereas NO_2 concentration was high in the Benelux area and low in the Po Valley. The difference in the NO_2 concentrations can be explained by the large influence of the anthropogenic sources over the Benelux area. These sources include industrial activities combined with high population density. In the Po Valley the high AOD values can be explained by the influence of high concentrations of organic matter. These satellite findings will be supported by ground based and zeppelin measurements when available.