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STUDY OF REMOTE SENSING PARTICULATE MATTER AIR POLLUTION OVER NORTHERN ITALY

Due to their effect on human health, atmospheric pollutants are a major study topic in the Po valley, one of the main industrialized and populated areas of the country. Our work focused on the applicability of satellite Aerosol Optical Depth (AOD) retrievals in support of air quality monitoring and assessment in urban environments within the Po valley. This was accomplished by using the International MODIS/AIRS Processing Package (IMAPP) Air Quality Applications software, IDEA-I (Infusing satellite Data into Environmental Applications-International). IDEA-I is a globally configurable package that uses either Terra or Aqua Moderate resolution Imaging Spectro-radiometer (MODIS) AOD product (MOD04) retrievals to provide a 48-hour forecast of the aerosols. The study focused on the whole 2012, with Level 2 Aerosol Products Collection 5.1 providing AOD data at $0.55 \mu\text{m}$ with $10 \times 10 \text{ km}^2$ spatial resolution at nadir. The retrievals were compared with Particulate Matter (PM₁₀) ground station measurements from the Italian Regional Environmental Protection Agency (ARPA) network. The acceptable results obtained by the correlation PM₁₀ –AOD suggest satellite AOD as a good candidate for monitoring air quality especially if ground data is not available. As the resolution of MOD04 is still too large for quantitatively accurate retrievals at sub-urban scale, a new Multi-Angle Implementation of Atmospheric Correction (MAIAC) algorithm, developed for MODIS, which provides AOD data at 1 km of spatial resolution, was assessed. The relationships between PM₁₀ concentrations, AOD, and AOD normalized by Planetary Boundary Layer (PBL) depths obtained from NOAA National Center for Environmental Prediction (NCEP) Global Data Assimilation System (GDAS) were studied. The results show that MAIAC retrievals provide a high resolution depiction of the AOD within the Po Valley, performing nearly as well in a statistical sense as the standard MODIS retrievals during the time period considered.

Working group IAS (WG1, WG2, WG3) o sessione speciale (SPR)

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