

AOT calibration by spatio-temporal model in Northern Italy

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Abstract: In this work, we explore the relationship between column aerosol optical thickness (AOT) derived from the Moderate Resolution Imaging Spectroradiometer (MODIS) on the Terra/Aqua satellites and daily PM₁₀ measured at the surface at locations in Po Valley, Northern Italy. We propose a dynamic spatio-temporal model for mapping of PM₁₀ using AOT, mixing layer height (HML), elevations and the Normalized Difference Vegetation Index (NDVI) as exogenous variables. Since satellite measurements have many missing values, a combination of EM algorithm and smoother Kalman filter is used.

Keywords: AOT; EM algorithm; PM₁₀; Spatio-temporal modelling.