

# **Development of perez-du mortier calibration algorithm for ground-based aerosol optical depth measurement with validation using SMARTS model**

## **Abstract**

Aerosols are small particles suspended in air that have wide varying spatial and temporal distributions. The concentration of aerosol in total columnar atmosphere is normally measured using aerosol optical depth (AOD). In long-term monitoring stations, accurate AOD retrieval is often difficult due to the lack of frequent calibration. To overcome this problem, a near-sea-level Langley calibration algorithm is developed using the combination of clear-sky detection model and statistical filter. It attempts to produce a dataset that consists of only homogenous and stable atmospheric condition for the Langley calibration purposes. In this paper, a radiance-based validation method is performed to further investigate the feasibility and consistency of the proposed algorithm at different location, day, and time. The algorithm is validated using SMARTS model based on DNI value. The overall results confirmed that the proposed calibration algorithm is feasible and consistent for measurements taken at different sites and weather conditions.