

Assessment of High Resolution PlanetScope Imagery for Aerosol Remote Sensing Applications

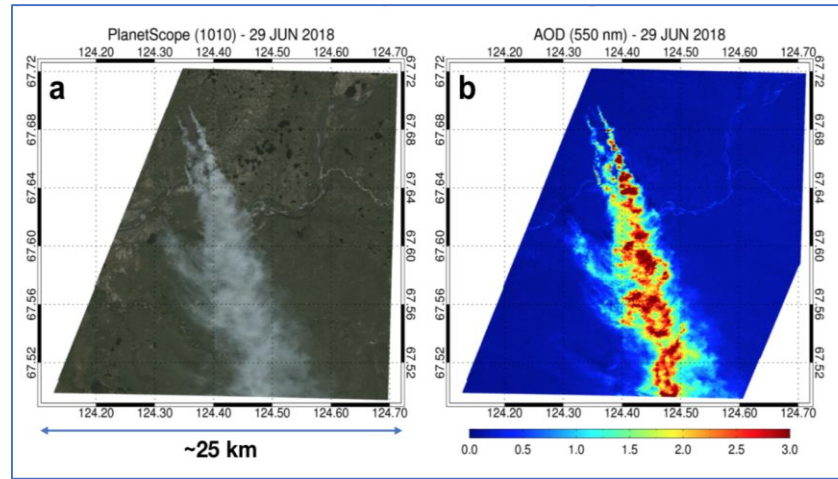
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Purpose: Create long-term, consistent aerosol datasets using passive imagers for climate and air quality studies

Study Objective: Assess the suitability of PlanetScope imagery in terms of signal-to-noise ratio for Aerosol Optical Depth (AOD) retrievals at a higher spatial and temporal resolution

Imagery: PlanetScope

Findings: PlanetScope imagery has sufficient radiometric quality for enabling the retrieval of AOD at approximately 15 m spatial resolution. Further research is required to fully understand, and address issues associated with among-Dove radiometric calibration.



Visible imagery from PlanetScope shows a fire smoke plume (left); AOD derived from PlanetScope (left).

Sensor	SNR (blue)	SNR (red)
PlanetScope	43	74
MODIS	146	316
VIIRS	128	272

Theoretical signal-to-noise (SNR) ratio for PlanetScope satellites; MODIS and VIIRS instrument per unit AOD. SNR was calculated assuming radiometric uncertainties of 4% and 1% for PlanetScope and MODIS/VIIRS, respectively, and using reflectance difference between two scenes with different AOD values over dark, vegetated surfaces.

Comparison of PlanetScope AOD against AERONET at Beijing site. Data points are arbitrarily color-coded for different sensor IDs. Black solid line is for 1:1 relationship, and dotted lines for an expected error envelop of $\pm 0.05 \pm 20\%$.

