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Aerosol measurements over CSIR-Paardefontein (South Africa) test range using LIDAR

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Abstract content
   (Max 300 words)

In order to calibrate EO multi-spectral satellite imagers using the vicarious calibration approach, it is essential to know the history and current status of aerosol loading and atmospheric properties over the calibration site. The background atmosphere condition and aerosol loading, acts as a input to radiative transfer code (RTC) in order to simulate the top of atmosphere (TOA) radiance. Aerosol and atmospheric properties have a major effect on the transmission of solar radiation from the sun to the surface and returns back to the sensor. The atmosphere can also degrade the spatial image characteristics (e.g., the contrast of an object observed against a background). LIDAR (Light Detection and Ranging) measurement campaign at the CSIR-Paardefontein test range (25°29'4.79"S, 28°22'51.25"E) was planned and executed to evaluate aerosol loading. The CSIR Paardefontein test range site was chosen as a permanent validation/vicarious calibration site to validate and calibrate Earth Observing (EO) multi-spectral imagers. Note, the construction of a large test target, that will be visible from space, is currently underway. In this paper, we present the results obtained during the campaign and the variations in aerosol extinction coefficient retrieved based on LIDAR signal. The temporal evolution of the aerosol extinction coefficient shows that the aerosols loading were not found to be stable over the site during the measurement period. We are planning to use the retrieved aerosol information as a RTC to calculate TOA required during vicarious calibration of EO multi-spectral imagers.

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