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Vicarious Calibration of ASTER/VNIR Onboard Terra Satellite Based on Measurements and Characterization of Aerosol Refractive Index and Size Distribution

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Abstract

A method for the after-launch verification of the linearity of the satellite based visible near-infrared radiometer using two or more earth surfaces where reflection factors differ is proposed. Through the check by experiment were performed and confirmed validity. Moreover, validity of the empirical refractive index for vicarious calibration determined from our four year observation data of the solar direct, diffuse and aureole was checked through a comparison to the vicarious calibration with the directly measured refractive index using solar direct and diffuse irradiance measurement data. As a result of applying the aforementioned empirical aerosol parameters to vicarious calibration of ASTER/VNIR, validity of the empirical aerosol parameters are confirmed for 7.5 years of ASTER/VNIR data. It is also found that linearity of VNIR response (input to output characteristic) is confirmed.

Keywords: Vicarious calibration, Refractive index, Size distribution, Linearity, Solar reflectance wavelength channels

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