

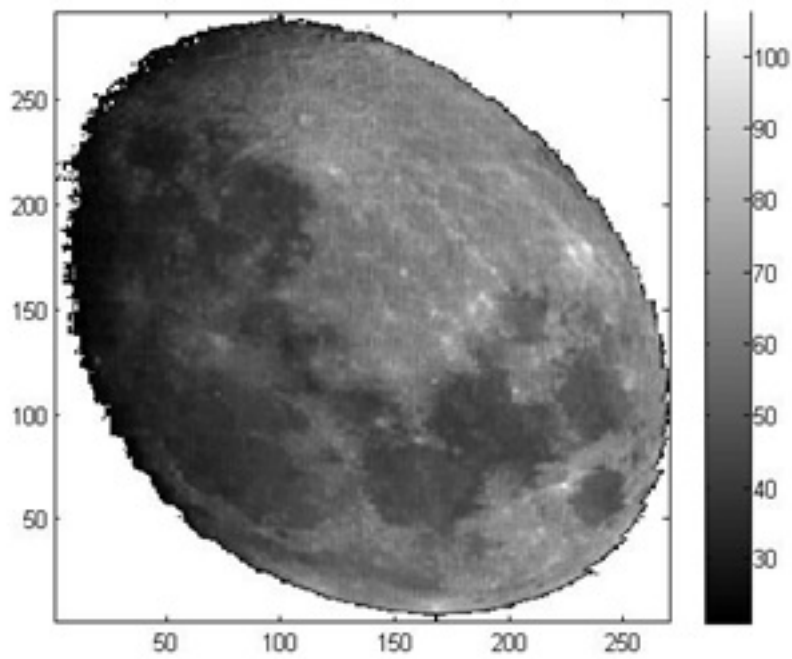
Calibration of INSAT-3D meteorological satellite imager visible channel using Moon

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INSAT-3D is India's meteorological geostationary satellite an exclusive next generation mission designed for enhanced meteorological observations having 6 channel imager and 18 channel sounder. INSAT-3D Spacecraft was dedicated to Nation at National Satellite Meteorological Center (NSMC) indigenously designed developed INSAT-3D Meteorological Data Processing System (IMDPS), commissioned at India Meteorological Department (IMD) New Delhi on January 15, 2014. The Moon is being observed from INSAT-3D regularly in the of full-disk operational image of earth with rectangular field of regard in IMDPS New Delhi. INSAT-3D measurements of lunar surface observed in Visible (0.55 - 0.75 μm), Short Wave Infrared 1.55 - 1.70 μm , Mid Wave Infrared (3.80 - 4.00 μm), Water Vapor (WV) 6.50 - 7.10 μm , Thermal Infrared (TIR) 1 & 2, 10.3 - 11.3 μm & 11.5 - 12.5 μm wavelength regions. The visible and infrared wavelengths region provide a new and intriguing methodology of distinguish in sensitivities of Earth observing radiometers. The Moon has been widely used for calibration of earth-observation missions across international community due to its temporal stability absence of any intervening medium such as atmosphere and its spectral resemblance to ground targets. As a preliminary step, attempt has been made to calibrate the VIS channel of INSAT-3D imager using Moon as a calibration source. For the requirements, a GIRO (RObotic Lunar Observatory, ROLO) model has been installed in National Satellite Meteorological Centre, INSAT-3D Meteorological Data Processing System, India Meteorological Department and New Delhi for output irradiance of Moon. Further, this irradiance is compared with INSAT-3D-measured Moon irradiance during July 2015 to June 2016. The preliminarily result shows INSAT-3D is overestimating against the GIRO model output irradiance. However, the pattern found consistency during the period, and no degradation can be estimated with this short span of time and found useful to generate the coefficients.

Keywords: INSAT-3D, Lunar Calibration, GIRO Model



Moon is captured by INSAT-3D visible channel image acquired 2016 August 22, on 0858 UTC (right). (Courtesy: GSICS Annual Meeting, Mitra A.K. and Parihar S., 2017).