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**Characterization of Radiometric Uniformity and Stability of Ground Site
for Post-Launch Calibration of INSAT-3D/R at IMD**

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Vicarious calibration methods is the reflectance-based approach that is applied here for radiometric calibration of sensors onboard for geostationary satellite INSAT-3D. A joint campaign for radiometric calibration of optical sensor of INSAT-3D in the year 2013 started the search of a suitable site of at least 5 km x 5 km area of time invariant and uniform reflectance over the Thar Desert (desert sand), Jaisalmer in the state of Rajasthan and Bhuj, Gujarat. The initial field campaigns were made at the site and in-situ measurements were carried out to check the suitability of selected Calibration/Validation (Cal/Val) site.

Cal/Val observations on the site were carried out with hyper-spectral Spectroradiometer covering the spectral range of 350nm-2500nm for radiometric characterization of the site to obtain the surface reflectance. The Sunphotometer/Ozonometer for measuring the atmospheric parameters has also been used and calibrated radiance that is converted to absolute at-sensor spectral reflectance that is known as Top-Of-Atmosphere (TOA) radiance. The spectral signature and top of the atmosphere (TOA) radiance were computed using radiative transfer model 6S (Second Simulation of the Satellite Signal in the Solar Spectrum), which can accurately simulate the problems introduced by the presence of the atmosphere along the path from Sun to target (surface) to the sensor. This method has been applied on Jaisalmer site on first place thereafter over Bhuj site for INSAT-3D imager visible channel. In depth analysis has also been carried out with Moderate-Resolution Imaging Spectroradiometer (MODIS) Aqua

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data and National Oceanic and Atmospheric Administration (NOAA) derived products over Bhuj site. Further, the study demonstrates the procedure for similar exercise for site selection for Cal/Val analysis of other satellite over India region. The overall results shows that the mean difference in vicarious calibration coefficients for the INSAT-3D imager is less than 3% for all campaign days over Bhuj site. Therefore, present study concludes that Bhuj site is the preferred site for post launch calibration due to its accessibility, high degree of homogeneity, which helps to derive precise vicarious calibration coefficients. The scope of the paper is to fully describe the characteristics of a test site so that those referring to its use or those seeking to use it, can assess its suitability for their application.