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PHASE 2 RESULTS: CALIBRATION AND VALIDATION OF KHALIFASAT

Abstract

KhalifaSat, which was launched on 29th October 2018, is considered the United Arab Emirates' (UAE) first fully developed satellite in-house by the engineers at Mohammed Bin Rashid Space Centre (MBRSC). The satellite was launched into a Sun-Synchronous orbit at an altitude of 613 km and provides high resolution imagery at 0.73m PAN and 2.98m Multi-spectral bands. The images taken by KhalifaSat were calibrated and validated during post-launch phase. In this paper, the second phase of Calibration and Validation activities of KhalifaSat images will be introduced. It will present the Second Phase of Geometric and Radiometric Calibration results of KhalifaSat images. In geometric calibration, Attitude Bias Estimation (ABE) results will be discussed further by investigating the different error patterns and how this will control the type of bias that exists in the satellite. Second phase results of ABE will show that any update in Flight Control System (FCS) will directly affect the ABE results due to the relationship between updating the sensor parameters and attitude bias calculations. Furthermore, geolocation accuracy is significantly improved to sub-meter accuracy after applying ABE, which satisfies the system requirements. In Radiometric calibration, Phase 2 results for glitch compensation will show remarkable improvement in removing all glitches. In addition, post-launch calibration will be conducted using post-launch images and will be used in order to validate the initial results.