IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advances in Space-based Navigation Technologies (7)

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CALIBRATION AND VALIDATION OF THE EGNOS GEO-3 GROUND STATIONS WITH THE ECVF

Abstract

For the preparation for the next generation of Satellite-Based Augmentation System (SBAS) services, the EGNOS GEO-3 payload was launched by Eutelsat. The signals broadcasted by the payload require high levels of accuracy and reliability, where the ground stations providing the uplink signal play an essential part in this. The EGNOS Calibration and Validation Facility (ECVF) has been developed to ensure correct design and operation of the stations. The ECVF is able to generate and capture signals at all points in the ground stations' amplification and transmission chain. With this capability, it is able to measure the effects on the SBAS signals induced by the ground stations' amplifier electronics and signal-carrying infrastructure, but also those effects due to external factors. Metrics include the correlation loss, S-curve bias, code-carrier coherence and code-phase variation. It is shown that the ECVF is able to reach an (equivalent) precision on the order of approximately 2ps.