

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advances in Space-based Communication Technologies, Part 1 (5)

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SATELLITE UPLINK INTERFERENCE MEASUREMENTS IN THE 437 MHz UHF AMATEUR
RADIO BAND ONBOARD LUME-1

Abstract

Satellite operators struggle to communicate with their satellites in the UHF amateur band (430–440 MHz) due to high power in-orbit interference. Statistical characterisation of the interference beyond average interference levels using in-orbit measurements is useful for the design of suitable counter measures. Some recent studies have started to investigate both the frequency and time behaviour of the interference, but more measurements are needed to cover the whole UHF amateur band. In this paper, we use the Local Mean Envelope (LME) method to analyse the time and frequency characteristics of in-orbit radio interference from the LUME-1 in the 437 MHz band. Satellite measurements were performed on a Software-Defined Radio (SDR) in orbit and the results were analysed on the ground. The average power spectrum and the variability of the LME for different time windows in the 437 MHz band are presented. The data analysis also includes the coefficient of variation of the LME to study the dispersion of the interference. The results are compared to measurements using the same method in the 435 MHz band. More measurements are needed for better spatial resolution. Knowledge of the time and frequency variability of the interference can indicate which mitigation techniques are required to improve satellite communication in the band.