Current State of Conjunction Monitoring for Satellite Operators and the Steps Forward

Joseph Chan
Intelsat, 3400 International Dr., NW, Washington DC, 20008
+1.202.944.778, Joseph.chan@intelsat.com

Keywords: *Collision monitoring, Conjunctions, Close approaches*

ABSTRACT

The paper will discuss the current state of conjunction monitoring for the satellite operators. We will go over the general conjunction monitoring systems for satellite operators and will focus on the systems implemented at Intelsat. In this presentation we will present our experiences on satellite conjunctions and our end-to-end process to validate potential close approaches and if necessary to plan maneuvers to increase miss distances. We will discuss the risks for the current systems including the many false alerts and missed conjunctions. We will also discuss other ideas for moving forward including (1) acquiring independent data to validate orbit uncertainties, (2) data fusion to improve orbit solutions accuracies and uncertainties, (3) different conjunction detection techniques and selection of thresholds to provide more reliable and actionable assessments and (4) techniques to monitor miss distances to help validate potential close approaches. We will present the different studies and analyses on improving satellite conjunction monitoring and mitigations including (1) sensitivity studies and covariance analyses showing the benefits of fusing measurement data from different measurements types; (2) an experimental data weight technique to determine the optimal relative data weights for data fusion and to estimate the realistic uncertainties in the final orbit solutions and (3) an idea for monitoring miss distances during satellite close approaches.