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INTERNATIONAL SHARING OF SATELLITE TRACKING DATA FOR IMPROVED ORBITAL  
SAFETY

**Abstract**

Data sharing and exchange among different Space Situational Awareness (SSA) data collectors/providers is frequently discussed as a mechanism to improve the accuracy and precision of orbital safety products. Indeed, at the conceptual level this claim is quite sensible: objects with more tracking, and thus presumably better distribution of that tracking about their orbit, should produce updates with smaller epoch errors and more realistic covariances at epoch, which should then translate into better performance in prediction and thus improved close approach calculations. In an effort to prove this thesis with real life data, the United States Office of Space Commerce (US OSC) and European Union Space Surveillance and Tracking (EU SST) have embarked since 2022 on a joint experiment, sharing observations from both of their worldwide SSA networks.

An initial work focused on sample satellites from Low Earth Orbits (LEO), Medium Earth Orbits (MEO), and Geosynchronous Orbits (GEO). Observations were collected during the 60-day period from June 2022 to July 2022. Approximately 20 sensors from the US and a similar number from the EU SST provided observations on 14 study satellites. Both surveillance networks have coverage spanning the globe with some complementary regions of coverage. An analysis regarding orbital accuracy helped demonstrate and quantify the benefits of data sharing at the observation level, and its results shared publicly in the form of a conference paper at AMOS 2023.

To go further and assess the benefits to space safety, this continuation of the joint study includes a set of real-world conjunctions with significant risk that had been processed by both the US OSC and EU SST. Since the results of the US OSC and the EU SST were available in historical records, the new analysis only examined the effects of using combined observational data for the conjunction assessment. The evaluation included an examination of the resulting covariance and comparison with the historical Conjunction Data Messages (CDM).

The presentation will provide a full accounting of the experiment's results as well as a set of lessons learned for data sharing. The hope is that, through this work, a pathway can be established for expeditious and fruitful sharing among collection entities, both commercial and governmental.