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EVALUATION OF A COMMERCIAL RADAR NETWORK TO SUPPORT CONJUNCTION ASSESSMENT

Abstract

LeoLabs' network of ground-based phased array radars provides high resolution data on LEO objects. In 2017 Airbus conducted a joint study with LeoLabs on the suitability of this data to mitigate collision risk for active satellites. A bottom-up assessment is performed simulating the current and a possible future architecture performance. After these initial simulations experimental benchmarks against real use cases have been performed. The use of LeoLabs' measurements for orbit determination is validated against truth orbits provided by the International Laser Ranging Service (ILRS). The consistency of these results in terms of orbital accuracy and covariance realism is confirmed by using different orbit determination tools. Finally, a concept of operations for possible improvement of conjunction assessment has been evaluated for Airbus operated SPOT 6 and 7 satellites. The paper shows one successful case of lowering the Probability of Collision (PoC) with the current system. The proposed methodology should be applied to the future sensor architecture to analyze full collision avoidance service performance.