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Author: Dr. Paula H. Krisko
National Aeronautics and Space Administration (NASA), United States, paula.krisko-1@nasa.gov

NASA ORBITAL DEBRIS BASELINE POPULATIONS

Abstract

The NASA Orbital Debris Program Office has created high fidelity populations of the debris environment. The populations include objects of 1 cm and larger in Low Earth Orbit through Geosynchronous Transfer Orbit. They were designed for the purpose of assisting debris researchers and sensor developers in planning and testing. This environment is derived directly from the newest ORDEM model populations which include a background derived from LEGEND, as well as specific events such as the Chinese ASAT test, the Iridium 33/Cosmos 2251 accidental collision, the RORSAT sodium-potassium droplet releases, and other miscellaneous events. It is the most realistic ODPO debris population to date. In this paper we present the populations in chart form. We describe derivations of the background population and the specific populations added on. We validate our 1 cm and larger Low Earth Orbit population against SSN, Haystack, and HAX radar measurements.