

Starlink Satellite Collision Probability Simulation Based on Simplified Geometry Model

Authors : Toby Li, Julian Zhu

Abstract : In this paper, a model based on a simplified geometry is introduced to give a very conservative collision probability prediction for the Starlink satellite in its most densely clustered region. Under the model in this paper, the probability of collision for Starlink satellite where it clustered most densely is found to be 8.484×10^{-4} . It is found that the predicted collision probability increased nonlinearly with the increased safety distance set. This simple model provides evidence that the continuous development of maneuver avoidance systems is necessary for the future of the orbital safety of satellites under the harsher Lower Earth Orbit environment.

Keywords : Starlink, collision probability, debris, geometry model

Conference Title : ICPA 2023 : International Conference on Physics, Cosmology and Astrophysics

Conference Location : Tokyo, Japan

Conference Dates : August 17-18, 2023