Paper ID: 65653
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19th IAA SYMPOSIUM ON SPACE DEBRIS (A6)
Joint Space Operations / Space Debris Session – STM Operations (10-B6.5)

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SMALL SATELLITE COLLISION RISK MITIGATION USING DIFFERENTIAL DRAG

Abstract

LeoLabs and Planet examine the effectiveness of differential drag maneuvers to mitigate the significant and growing collision risk presented by orbital debris and other satellites in low Earth orbit (LEO). Previously, Planet has demonstrated that small satellites such as CubeSats with attitude control are capable of executing orbit phasing maneuvers through differential drag. In this study, we will utilize LeoLabs' real-time streaming conjunction service, which currently issues over 1 million conjunction data messages (CDMs) per day, combined with on-orbit ballistic coefficient data derived from Planet's Dove imaging satellites, to demonstrate that differential drag maneuvers for collision risk mitigation are an effective strategy for safe operation of small satellites without propulsive capabilities.