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Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal
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SPACE ENVIRONMENT MANAGEMENT: FRAMING THE OBJECTIVE AND SETTING
PRIORITIES FOR CONTROLLING ORBITAL DEBRIS RISK

Abstract

Interest in orbital debris has been on the rise in recent years, as small satellites are launched in accelerating numbers, proposals for large low-Earth-orbit LEO constellations mature, and the orbital debris population continues to grow. Environmental models are being exercised to predict collisional risk, private equity is now supporting the development of commercial Space Situational Awareness (SSA) and Active Debris Removal (ADR) services, and debris mitigation best practices and licensing guidelines are being updated by industry groups and national administrations. These are all positive responses to an increasingly challenging space operational environment, but as is often the case, we tend to rush to solutions before adequately defining the problem we are trying to solve.

The authors propose Collisional Mission Assurance (CMA) as a deceptively simple objective and Space Environment Management (SEM) as the comprehensive framework the space community can use to assess the efficacy of its efforts and to prioritize the appropriation of its resources. The authors then establish the lethal nontrackable (LNT) debris population as the primary risk to assured operations in space and point to debris prevention and environmental remediation as our most effective tools to achieve the CMA objective. The paper concludes with specific recommendations for setting priorities and directing the community's efforts and resources.