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Policy, Legal, Institutional and Economic Aspects of Space Debris Detection, Mitigation and Removal
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MATCHING LEGAL LIABILITIES WITH TECHNICAL SOLUTIONS TO GEOSTATIONARY ORBIT
DEBRIS

Abstract

The debris environment in space is posing a serious risk to space systems and posing the risk of making some orbits unusable. The issue has received considerable attention both technically and legally. Much of this work assumes that the same legal and technical solutions apply across all orbital regimes, but this is not the case. In the particular case of geostationary orbit, subtle legal differences and major technical differences interact, necessitating different solutions in both areas.

The ratio of commercial to State operated satellites is higher, so the legislative route that determines how State liabilities under the UN Outer Space Treaty flow down to the operators becomes of greater importance. Currently the risk in Low Earth Orbit could be substantially reduced by removing only state owned satellites (although this may change with commercial large constellations) and thus the issue of disposal of commercially owned satellites need not be resolved. In geostationary orbit however, the overwhelming number of commercial satellites means the issue will need resolution. The legal right of operators to a determined position in space is also unique to geostationary orbit, so a code of conduct to avoid collisions that assumes a satellite can move substantially, would not be applicable to geostationary orbit. Already the number of evasion manoeuvres geostationary satellites have to perform is a matter of concern.

Turning to technical considerations. The accuracy of tracking the debris population means the level of warning that can be assumed are less reliable and the source of even large debris can be uncertain. The design of geostationary satellites is different; they are less robust, have different and possibly fragile surface finishes and many are spinning, so capture techniques will need to be different. And as disposal by atmosphere re-entry is not practical, different disposal strategies are required.

The general understanding of the situation and technical capability to respond to the debris problem determines what can be judged a legally “reasonable” response. Thus legal liability changes with the technical evolution of the subject. So although the 2007 IADC Space Debris Mitigation Guidelines already embrace some of the LEO/GEO differences, the paper argues that recent work on the distinctive nature of geostationary orbit requires greater special case treatment. It also considers if this can be incorporated in a universal legal framework or whether a separate legal framework should be established for geostationary orbit.