

SPACE DEBRIS SYMPOSIUM (A6)  
Mitigation, Standards, Removal and Legal Issues (4)

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MEDIUM EARTH ORBITS: IS THERE A NEED FOR A THIRD PROTECTED REGION?

**Abstract**

The Inter-Agency Space Debris Coordination Committee (IADC) and the United Nations have adopted the concept of near-Earth regions which should be afforded protection from the accumulation of orbital debris. These regions are low Earth orbit (LEO), which extends up to 2000 km altitude, and geosynchronous orbit (GEO), which includes the volume of space encompassed by 35,786 km +/- 200 km in altitude and +/- 15 degrees in inclination. The region between LEO and GEO is commonly referred to as Medium Earth Orbit (MEO). Although historically a small minority of spacecraft have operated in MEO, the number of such satellites residing in or routinely transiting the zone is increasing. The question thus arises: should MEO be considered an orbital debris protected region? This paper first reviews the characteristics of space systems now utilizing MEO, as well as those anticipated to join them in the near future. MEO is then contrasted with LEO and GEO, both physically and pragmatically. Recommended orbital debris mitigation guidelines for MEO space vehicles are highlighted, and the challenges of spacecraft and launch vehicle stage disposal are recognized. Note is also made of the principal tenets of the United Nations Outer Space Treaty and of recent trends toward de facto partitioning of MEO. Finally, the efficacy and practicality of establishing MEO as a new protected region with regard to orbital debris is addressed.