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Assuring a Safe, Secure and Sustainable Environment for Space Activities (4)

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SMALL SATELLITES CONSTELLATIONS PHENOMENA AND SPACE TRAFFIC MANAGEMENT  
IN TERMS OF STATE OF ART, FUTURE PERSPECTIVES AND POSSIBLE WEAKNESSES

**Abstract**

Earth Observation Small satellites allowed non-traditional actors as universities, private companies, research centers and non-space-faring nations to launch satellites in orbit at a lower price. The number of satellites that are going to be placed in orbit will rise exponentially, thus bearing a twofold risk: In the short term, the collision between two or more space objects, can result in the debris generation, while, in the long-term, one could incur in the so-called “Kessler Syndrome”, i.e., a theoretical scenario in which the space pollution is high enough that collisions will give rise to more debris and lead to more collisions, in a chain reaction, resulting in space environment degradation. Conversely, there has been no process in building a framework to mitigate the side effects of the increased congestion in space. From a normative perspective, the problem is embedded in sustainability’s legal dimension, thus regulated by treaties, guidelines, and codes of conduct. It is logical to assume that stakeholders will develop both institutional and commercial solutions to those problems. To that aim, space situational awareness (SSA) systems are growing in importance, and the in-orbit satellite’s management will be a crucial feature. As space is becoming increasingly congested, the issue of space traffic management (STM) becomes ever more salient, particularly in low Earth orbit (LEO). This paper is going to provide an in-depth review of how institutions, private actors and the stakeholder community are responding to this challenge from a normative standpoint, and try to highlight prospects and possible weaknesses on the subject from a space economy perspective.