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POSSIBLE FUTURE SPACE DEBRIS MITIGATION AND REMOVAL LEGAL, REGULATORY AND TECHNICAL SCENARIOS

Abstract

Nowadays, carrying out successful space activities requires additional efforts to manage the increasing concerns coming from space debris. Different stakeholders, from space agencies to industrial players, are proposing new measures to tackle the issue, ranging from enhanced space debris detection, improved mitigation procedures and innovative removal solutions. However, in many cases the technical measures fail to consider the issue as interdisciplinary, not contemplating the policy, legal and regulatory point of view. First of all, the concept of "sustainability of space activities" should be addressed in a more concise way to achieve enforceable regulation. There is therefore a need to focus first of all on the current sources that make space debris a potential problem, for example collision risk, third party liability, increasing of operational costs, offset of externalities on future space players, and so on. From this analysis, a recognition and alignment of technical standards can be undertaken with the rules related with liability in space and on ground. While space debris-specific regulations and technical standards will most likely evolve in the near future to adopt the state-of-the-art technology as binding in acquiring a license to launch and operate in space, the space community is still facing the fact that so far, very few cases have been analyzed. This situation has contributed to a number of "grey areas" in the regulatory and legal landscape. Ideally, in the future, non-compliant operators would face legal consequences (e.g. withdrawal of license, payments into funds, etc.). More realistically, space operators should be convinced to have a more proactive behavior towards minimizing space debris proliferation by the economic advantages that a low-risk space environment can lead to in the long-term. In this paper, several case studies involving issues such as liability and casualty will be explored and analyzed. The results will then be compared with the state-of-the-art technical solutions and with the possible future perspectives in term of policy and regulations.