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CHALLENGES IN ACTIVE SPACE DEBRIS REMOVAL: A DISCOURSE NETWORK ANALYSIS
UNFOLDING COMPLEX INSTITUTIONAL LOGICS

Abstract

The growing challenge of space debris has become a center of attention in recent years and there has been increasing news reporting on the issue across public media. More specifically, the concept of active debris removal (ADR) was introduced, which has gravitated much attention following reported incidents of anti-satellite tests and the recent development of satellite megaconstellations. The emergence of the ADR concept over the years, however, has not been a straightforward process. In fact, the concept of ADR struggled with gaining legitimacy among a diverse set of actors in the space sector before stabilizing into an increasingly accepted norm. Drawing from institutional theory, this study traces the institutional logics guiding the ways different actors in the space sector perceive the challenge of space debris and relate to the concept of ADR.

This study draws on an in-depth discourse network analysis on about 300 English newspaper articles reported on issues of space debris from year 2007-2020. The newspaper articles were carefully selected from the Lexis Nexis database. Using an institutional logics approach, a systematic coding scheme was developed to map how different actors in the field view the idea of ADR over the years. This includes whether they agree or disagree with, and the major opportunities and institutional challenges they pointed out regarding the ADR concept. Subsequently, we derived networks based on these discourses in the field according to four time periods distinguished by major events in the space sector. In addition, we simultaneously derived 'organizational' networks for these four time periods, reflecting the types of organizations that have been leading the debates in advancing the field of space debris management.

Our analysis shows that, although the concept of ADR has gained sufficient legitimacy in recent years, some critical issues remain as challenges and deserve urgent attention to be addressed. These include, amongst others, the ambiguity of leaderships, the lack of international coordination and data sharing, as well as issues on trust and transparency. Our organizational networks bring potentially interesting implications to the field, as they showcase which organizations share converging views and tend to 'cluster', highlighting the potentials for collaborations in driving space debris management forward in the near future.