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ENSURING OPERATIONAL SPACE SAFETY IN AN UNPREDICTABLE SPACE ENVIRONMENT

Abstract

The EUMETSAT core mission provision of high availability meteorological data from satellites in Geostationary and Low Earth Orbit has been proven to result in the most beneficial impact to weather forecasting accuracy, essential for societal economic activity and safety of life. Improving safety on earth is therefore intertwined with ensuring safety in space and EUMETSAT is proactive in putting in place measures to ensure the resilience of its satellite fleets and associated ground system infrastructure.

Concerning Space Safety, operations processes at EUMETSAT have matured and been refined over the last decade for managing debris conjunctions while significant effort is invested in securing system and network resilience. Ensuring resilience against space weather effects on the other hand has typically been left to the satellite developers, such that satellite operations teams do not actively look at advanced solar activity warnings.

Indeed, anomaly statistics do show that solar activity has not caused significant issues on the EUMETSAT satellites to date. A look at solar activity since the dawn of the space age indicates that we have been fortunate to operate in a relatively benign environment, but this was not the case in the past and there is a significant probability of a solar storm which would severely challenge the design resilience of all space and ground assets.

EUMETSAT is therefore preparing itself for such events and also coordinating with other operators, space weather service providers and satellite design authorities to help enhance the global satellite fleet resilience.

Based on interactions with Space Weather Service providers and lessons learned from other operators, a roadmap to ensuring an actionable space weather situational awareness system is being designed, with a view also to validation, training and with a clear understanding of the limitations, based on the reliability of the data currently available.

The paper will also outline the steps underway in EUMETSAT and together with the Coordinated Group for Meteorological Satellite to improve data supply to operational space weather services and therefore allow the spacecraft operators improved confidence levels in their decision making.