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Space Weather and Effects: Prediction, Analysis and Protection (3)

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EFFECT OF SPACE WEATHER PERTURBATIONS ON NANOSATELLITE COMMUNICATIONS
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Abstract

Space weather has dominated many technological aspects of our world for many years. The reason for this stems from the fact that space weather has a direct interaction with anything that has an electromagnetic component to it. Due to this fact, the effects of space weather need to be incorporated to the design aspects of any technological products that come in contact with it including satellites. Nanosatellites are especially prone to these conditions due to their vulnerability in LEO orbit. Moreover, nanosatellites are less structurally sound due to their initial configuration requirements. Hence, it is essential to take space weather requirements while designing a nanosatellite.

Space Weather Effects on Nano Satellites can be crucial. The Space weather is a crucial aspect to be dealt when designing any space based instruments. The solar winds, solar flares, galactic radiations are the chief sources which can cause fatal damage to objects in space. There are a many ways that a satellite mission can be hampered because of the space weather disturbances, because of Galactic Radiation, Trapped Radiation Belt and Solar Energetic Particle (SEP) Events. The Electronics of the space based instruments is susceptible to surface and deep dielectric charging which can be caused by high energy particles. The space weather anomalies can lead to perturbations in space communication system and cause temporary or permanent loss of the signals. We present here the effect of space weather on Low Earth Orbit (LEO) Nanosatellites, which are presently in trend for performing various space based experiments for the scientific community.