

Space weather predictability

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The term “space weather” refers collectively to all conditions and phenomena that occur in the space environment. These conditions are influenced by the Sun's activity and can affect space-borne and ground-based technological systems and, through these, human life and endeavour. Space weather effects are multifaceted and can be acute or long-term. Several decades of research through measurements, modelling and simulations have shown the existence of some rather reliable long-term correlations between the frequency/intensity of solar eruptions and their geospace effects. However, we have also realized that there are exceptions to such patterns, and, moreover, that similar solar eruptions and/or interplanetary disturbances can lead to geospace results of drastically different intensity. On the other hand, different types of geospace effects depend on quite different solar eruptions/interplanetary disturbances [1]. These deviations from the desired deterministic causality impose severe limitations to our efforts to accurately nowcast and forecast space weather. We will discuss selected aspects of space weather predictability, with an emphasis on the predictability of the creation of the outer Van Allen belt relativistic electrons [2].

References

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