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Authors:

Anthony M. DeStefano, Michael L. Goodman, Robert M. Suggs

Title:

The Probability of False Go/No-Go Determined by GOES Proton Flux: Proposed Launch Constraints for Avoiding Damaging Solar Energetic Particle Events

Abstract:

Most space-bound hardware needs to be designed to withstand space weather events to some degree. Long-term predictability of space weather events, such as solar flares or coronal mass ejections, are still a matter of theory so designers should assume a worst case event for their specific environment. In our analysis, we show preliminary results of the probability of encountering a false/true go/no-go based on a threshold launch and design proton environment. The goal in choosing a threshold launch environment is to avoid the chance of exceeding the design environment during vulnerable parts of the mission. Operationally, this method cannot predict damaging space weather but can aid in avoiding space weather events that are already occurring. The GOES proton flux database is used as a proxy for the heavy ion fluxes, which impart a greater threat because of larger single event upsets and effects. Our use of protons as a proxy for heavy ions is justified on the basis of the correlation between their fluxes shown by a qualitative comparison of GOES proton integral fluxes at > 10 MeV and ACE/SIS heavy ion integral fluxes.