

UNFOLDING ESA STANDARD RADIATION ENVIRONMENT MONITOR DATA USING AN ITERATIVE REGULARISATION METHOD BASED ON SINGULAR VALUE DECOMPOSITION

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The ESA Standard Radiation Environment Monitor (SREM) is the second generation of instruments in a program established by ESA's European Research and Technology Centre (ESTEC) to provide minimum intrusive particle radiation detectors for space science and applications. SREM is a solid state particle detector consisting of three silicon diode detectors in a two-detectors-head configuration. All the pre-amplified detector pulses are scrutinized by a set of fifteen fast comparators. In order to determine proton and electron flux spectra without the need of pre-assuming their spectral form we have implemented a regularized unfolding method which is based on the Singular Value Decomposition (SVD) of SREM calibration matrix. The method includes proper schemes that treat the numerical issues arising by the electron-proton contamination, the energy range overlapping and the low number of SREM counters. First test studies show that this method can be successful for the unfolding of both monotonic and non-monotonic spectra of energetic particles using SREM data.

Energetic Particles, Standard Radiation Monitor

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