

ENERGETIC PARTICLES IN THE HELIOSPHERE

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Abstract

The energetic particle population in the heliosphere is highly variable in space and time, intensity, energy, and composition. Over the last decades advanced instrumentation onboard many spacecraft extended our ability to explore the energetic particle populations in the inner and outer heliosphere. We are now able to measure intensity-time profiles and anisotropies, energy spectra, elemental and isotopic abundances, and the ionic charge of particles over an extended energy range of ~ 0.1 to 100 MeV/nuc and for a large dynamic range of particle intensities. These measurements provide crucial information for understanding the sources of the particle populations and the acceleration and propagation processes involved. In this paper we provide an overview of the various particle populations observed in the heliosphere, with emphasis on particles accelerated at the Sun, at inter-planetary shocks, in co-rotating interactions regions, and in the outer heliosphere.