

Particle Acceleration in the inner Heliosphere: Diffusive Shock Acceleration and Quiet-Time Processes

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Gradual solar energetic particle events are thought to be due to diffusive particle acceleration at coronal mass ejection driven shocks. By contrast, impulsive events are associated typically with particle acceleration somehow associated with solar flares and impulsive events low in the solar corona. Other events exhibit characteristics of both impulsive and gradual events, sometimes called mixed events. At other times, during quiet periods in the inner heliosphere, energetic particle distributions are observed frequently. The acceleration mechanism for the last remains largely unknown, although various suggestions have been put forward. We will present an overview of diffusive shock acceleration as it applies to the gradual and mixed solar energetic problem. The importance of understanding this as a dynamical rather than a stationary process will be discussed, the role of shock obliquity addressed, maximum particle energy from a shock discussed, the particle injection problem considered, and accelerated particle spectral properties described. If time permits, we will discuss briefly the acceleration of particles in the vicinity of the heliospheric current sheet during quiet periods by magnetic islands, also known as flux ropes.

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