

Energetic and suprathermal particle measurement at the inner heliosphere

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Particles that have energies of a few times the solar wind plasma energy up to 100s of keV/q are called suprathermal particles. Recent studies have revealed that these particles may a significant role as seed particles for further acceleration to higher energies. This may occur either close to the Sun in solar energetic particle (SEP) events, but also locally at 1 AU in energetic storm particle events, or even outside 1 AU as ions accelerated in Corotating Interaction Regions. The origin of these suprathermal particles is largely unknown at this time. It is therefore important to make high-time resolution measurements of the composition and spectra of this particle population in the inner heliosphere to better characterize its origins and role as a seed population in particle acceleration processes. Because of the vastly different mass-per-charge ratios of the various possible origins of suprathermal ions, we expect to see distinct difference and radial dependencies in their abundances in low-energy accelerated particles in the inner heliosphere. Here we describe the measurements on Solar Orbiter that are already making significant contributions to the understanding of the source, spectral shape and particle population in this largely unexplored energy range.