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Poster
Solar energetic particles (SEPs) are high-energy particles originating from the Sun and accelerated at the front of a CME-driven shock. They pose potential risks to space missions, especially those outside Earth's protective magnetosphere. Understanding their behavior in both the heliosphere and Earth's magnetosphere is vital for the safety and functionality of space exploration. The study focuses on how pitch angle scattering impacts the overall SEP population during various phases of SEP events.

The presentation compares two transport models that capture different aspects of the SEP dynamics. The Parker transport equation describes the evolution of the nearly isotropic particle population and effectively incorporates large-scale processes, including spatial diffusion and convection by the solar wind. However, by averaging over the particle pitch angle, the Parker equation inherently smooths over details of pitch-angle scattering and magnetic focusing. In contrast, the focused transport equation retains the pitch-angle dependence of the particle distribution function, enabling one to characterize the effects of scattering and the impact of magnetic focusing on the particle transport in the heliosphere. The presentation discusses the impact of accounting for anisotropy when modeling the SEP population during various stages of a SEP event.

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