

# **Acceleration at an evolving termination shock: particle spectra and anisotropies**

**V. Florinski** and G. P. Zank

Institute of Geophysics and Planetary Physics, University of California, Riverside

The termination shock is an evolving structure subject to collisions by large scale interplanetary disturbances, such as merged interaction regions, that dominate the solar wind during times close to the maximum solar activity. The Voyager 1 and 2 observations of accelerated particle intensities were performed during such a period (2002-2004) and undoubtedly bear an imprint of this variability. We study the effects of dynamic shock evolution on particle intensities and anisotropies, using the recently developed model of particle propagation that explicitly retains higher-order moments of the particle phase space density (first and second order anisotropies). Using several plausible scenarios of MIR initiation, we show that the variations in the termination shock compression ratio and distance have a profound effect on particle spectra. Typically, particles accelerated at such a dynamic shock possess a three component spectrum that is qualitatively similar to the Voyager 1 spectra, with lowest energy particles accelerated more recently at a strong TS, and the softer higher-energy component accelerated earlier when the shock was weaker. We also investigate other possible mechanisms for particle energization at low energies, including reflection and simple adiabatic compression combined with scatter-free propagation.