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Effects of Upstream Turbulence on the Termination Shock and Inner Heliosheath

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Abstract: Voyager 1 observations at the termination shock and in the heliosheath revealed new phenomena which required rethinking of some of our established paradigms. Very important among the new factors is the temporal and probably spatial variations which produce a number of effects which affect the energetic-particle spectra, anisotropies and their time variations observed at Voyager1.The observations suggest strongly that the shock is blunt, was moving rapidly inward as it crossed Voyager 1 and that the ow was deected signicantly from radial ow. These shock motions and ow patterns are likely to be signicantly non-steady and vary with both time and space. These properties have important conseqences for the acceleration and transport of energetic particles. In addition, the observed magnetic eld in the heliosheath exhibits large turbulent uctuations quite different from those observed in the supersonic upstream solar wind. These magnetic uctuations are interesing by themselves and also suggest the possibility of significant acceleration of energetic particles in the heliosheath by standard stochastic acceleration or diffusive compression acceleration.