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General anisotropy
30 min. invited talk

Energetic particle anisotropies at the heliospheric boundary

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Voyager 1 is currently exploring the region of space beyond the heliopause, known as the outer heliosheath. According to recent observations, the character of magnetic field in the outer heliosheath is very different from the heliosphere with its abundant waves and large-scale structures generated by solar activity. By contrast, interstellar space has little or no turbulent activity on short scales, relevant to MeV charged particle scattering and transport. In the absence of scattering, energetic particle populations develop large persistent first- and second-order anisotropies that were measured by Voyager 1 after the heliopause was crossed. I propose a possible interpretation of these anisotropies and the structure of the heliopause transition layer, which appears to be populated by magnetic flux tubes detached and sunk into the heliosheath by a pressure-driven instability. I also discuss the observations of magnetic fluctuations in the outer heliosheath and their implications for the physics of the IBEX ribbon feature, believed to be generated in that region.