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# The Magnetospheric Cusp

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At Boston University we have carried out an extensive study of the magnetospheric cusps using measurements recorded by the Cluster and Polar satellites. The cusp usually encountered by Polar is a very large region that is essentially always characterized by deep diamagnetic cavities filled with shocked solar wind plasma and energetic particles. Cluster on the other hand rarely finds the same depth or size of these cavities with energetic particles present but not always in the one-to-one association found by Polar. We have attempted to understand the components that must provide the energy density within the high-altitude cusp to create these diamagnetic cavities. With the advertised calibration data from the Polar team there is a deficiency of the measured plasma pressure in creating a balance. It appears clear that the local plasma from the solar wind creates the diamagnetic cavity. The perpendicular pressure provided by both the ions and electrons are highly anti-correlated with the turbulence as expected but the electrons surprisingly show a higher level of anti-correlation. The sense of the polarization of the observed electric component of the turbulence within these cavities in the direction perpendicular to B can provide resonate acceleration of ions rapidly to high energies.