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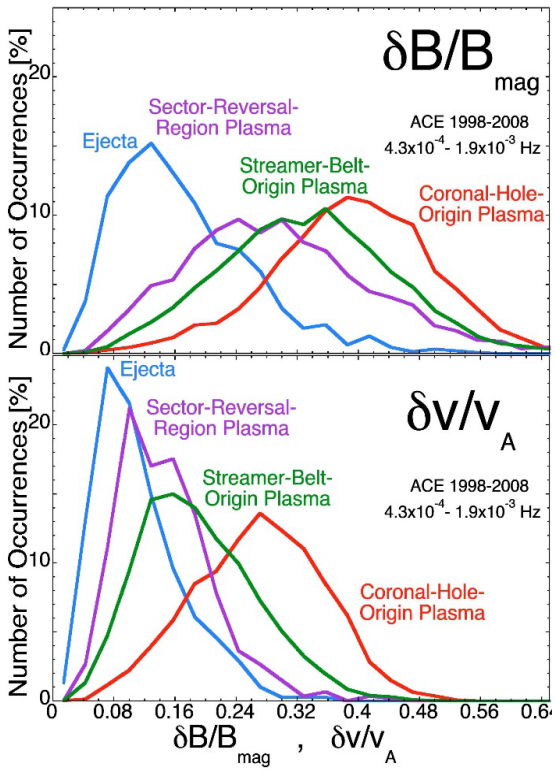
# Some Properties of the Solar-Wind Turbulence at 1 AU Statistically Examined in the Different Types of Solar-Wind Plasma.

This work is based on a data base of hourly averages of ACE MAG and SWEPAM solar wind data spanning the first half of the ACE mission (1998-2008). The paper (Borovsky, Denton and Smith, JGR 124, 2406 (2019)) uses a categorization scheme from Xu and Borovsky (JGR 120, 70, 2015) to separate the observations into four categories: (i) coronal-hole-origin plasma, (ii) streamer-belt-origin plasma, (iii) sector-reversal-region plasma, and (iv) ejecta. It uses basic plasma measurements such as temperature, density, and speed to divide the solar wind into these four plasma categories.

From there they compute the distribution of other relevant parameters that describe turbulence and plasma conditions and identify and develop basic differences between the four categories of observations. They find that there are statistical differences between these categories in 13 different plasma parameters, including magnetic intensity, plasma number density, spectral indices, Alfvénicity, and the anisotropies of magnetic field and velocity fluctuations. In time, these differences can be linked to either the source or interplanetary evolution of the wind. One of many results to come out of this study is the realization that both magnetic and velocity fluctuation levels are systematically higher in coronal-hole plasmas than in solar wind samples coming from the other three sources.




In addition, it is shown that there are systematic differences in the ratio of magnetic and velocity fluctuations perpendicular and parallel to the local mean magnetic field which has implications for the degree of compression in the fluctuations and, from this, the basic nature of the fluctuations.

Systematic differences in other plasma parameters were also found. Together, these differences point to possible distinctions in source dynamics and evolution of the plasma.

This item was contributed by C. W. Smith (University of New Hampshire) and J. E. Borovsky (University of Michigan). Address comments and questions to Charles.Smith@UNH.edu. See ACE News Archives for earlier ACE News items.