

Internal use only

Abstract number: S2-84

Measurements

30 min. invited talk

Seemingly Incongruous Voyager 1 & 2 Energetic Particle Observations in the Heliosheath Through 2011

Hill, M.E.¹, Decker, R.B.¹, Drake, J.F.², Hamilton, D.C.², Krimigis, S.M.¹, Opher, M.³ and Roelof, E.C.¹

¹Johns Hopkins University, Applied Physics Laboratory, Laurel, Maryland, USA

²University of Maryland, College Park, Maryland, USA

³Boston University, Boston, Massachusetts, USA

Conditions are changing in the heliosheath at the positions of Voyager 1 (V1) and Voyager 2 (V2) and are doing so in unexpected ways that so far defy a single consistent interpretation. Some characteristic intensity variations cut across a surprisingly broad range of energies and species, from termination shock particles (TSPs), to energetic electrons, to light and heavy anomalous cosmic rays (ACRs), and to galactic cosmic rays (GCRs). The changes must be a mix of spatial structure and temporal changes produced by the rise in activity of Solar Cycle 24 in January 2010. Yet there are drastic differences between some of the same species at V1 compared with V2. The puzzling observations include V1 ACR intensities beginning to decline while at V2 they are exponentially increasing, finally reaching levels comparable to or even exceeding those at V1. A distinct pattern of increases and decreases is seen at V2 in TSPs, electrons, light ACRs, and GCRs, but not in ACR heavy ions. However some things are happening similarly at V1 and V2, like a recent increase in GCR protons. We will present an overview of these observations, which also include spectral properties, anisotropies, and solar wind speed. An essential interpretive element is possible differences in the heliosheath configuration, in particular the location of the sector region between V1 and V2 and the proximity to the heliopause.