

Abstract Submitted  
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**A mechanism for the generation of anomalous cosmic rays: the reconnection of the 3-D sectored heliospheric magnetic field in the heliosheath** J.F. DRAKE, M. SWISDAK, K. SCHOEFFLER, University of Maryland, M. O'PHER, Boston University — The recent observations of the anomalous cosmic ray (ACR) energy spectrum as Voyagers 1 and 2 crossed the heliospheric termination shock have called into question the conventional shock source of these energetic particles. We suggest that the sectored heliospheric magnetic field, which results from the flapping of the heliospheric current sheet, piles up as it approaches the heliopause, narrowing the current sheets that separate the sectors and triggering the onset of collisionless magnetic reconnection. The energetic electron and other data support this scenario. Particle-in-cell simulations have been carried out to explore the 3-D structure of magnetic islands and associated particle acceleration. The magnetic islands develop a finite length in the out-of-plane direction. Nevertheless reconnection releases a large fraction of the energy in the sectored magnetic field. Most of the magnetic energy goes into energetic ions with significant but smaller amounts of energy going into electrons. The signatures of these 3-D magnetic structures are being explored for comparison with the Voyager data. If the reconnection scenario is correct, the observations represent the first in-situ exploration of multi-island particle acceleration.

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