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Reconnection Effects in the Outer Heliosphere: Is the Magnetic Field in the Heliosheath Sector Region and in the Outer Heliosheath Laminar? MERAV OPHER, George Mason University, JAMES DRAKE, MARC SWISDAK, University of Maryland, GABOR TOTH, University of Michigan — All the current global models of the heliosphere are based on the assumption that the magnetic field in the outer heliosheath close to the heliopause is laminar. We argue that in the outer heliosheath the heliospheric magnetic field is not laminar but instead consists of nested magnetic islands. Recently, we proposed (Drake et al. 2009) that the annihilation of the "sectored" magnetic field within the heliosheath as it is compressed on its approach to the heliopause produces the anomalous cosmic rays and also energetic electrons. As a product of the annihilation of the sectored magnetic field, densly-packed magnetic islands are produced.These magnetic islands will be convected with the ambient flows as the sector boundary is carried to higher latitudes filling the outer heliosheath. We further argue that the magnetic islands will develop upstream where collisionless reconnection is unfavorable. Due to the high pressure of the interstellar magnetic field the sectored region is carried mostly to the northern hemisphere (Opher et al. 2007). We present a 3D MHD simulation with unprecedent numerical resolution that captures the sector boundary. We suggest that within our scenario we can explain significant anomalies in the observations of energetic electrons in the outer heliosphere.

Merav Opher
George Mason University

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