Abstract Submitted
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Pickup ions in the heliosphere[1] NIKOLAI POGORELOV, Department of Space Science, University of Alabama in Huntsville, CHARLES N. ARGE, Goddard Space Flight Center, MICHAEL GEDALIN, Ben-Gurion University of the Negev, Beer-Sheva, israel, TAE KIM, CSPAR, University of Alabama in Huntsville, KYLE RENFROE, Department of Space Science, University of Alabama in Huntsville, VADIM ROYTERSHTEYN, Space Science Institute, Boulder, CO, MING ZHANG, Florida Institute of Technology — Charge exchange between the solar wind (SW) protons and H atoms in the local interstellar medium (LISM) gives birth to non-thermal, pickup ions (PUIs). The distribution function of PUIs created this way quickly becomes isotropic, but Maxwellian equilibrium is not reached. This raises questions about the proper description of PUIs crossing collisionless shocks, which are abundant in the space plasma. We discuss numerical approaches to modeling the flow of the mixture of thermal and non-thermal ions which constitute the SW. In particular, the observational data sets suitable for the validation of numerical simulations are discussed. We also compare solutions where PUIs are treated as a separate component of plasma with those where the plasma is assumed to be in Maxwellian equilibrium. Finally, we analyze the boundary conditions on the distribution functions and bulk properties of the SW flow and heliospheric magnetic field at collisionelss shocks, e.g., the heliospheric termination shock. Numerical simulations are compared with observations.

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