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# Solar Wind Interaction with the Local Interstellar Medium: Consequences for Cosmic Ray Propagation

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We present the results of our investigation of the solar wind (SW) interaction with the local interstellar medium (LISM). The model is based on MHD treatment of ions and takes into account their charge exchange with neutral atoms. We focus on the structures that affect the Galactic cosmic ray (GCR) transport: magnetic barriers in the heliosheath, instability of the heliopause, heliospheric boundary layer of strongly depressed plasma density on the LISM side of the heliopause, the effect of the neutral solar wind on the bow wave in the LISM flow, and new discontinuities identified in the LISM at distances exceeding 2,000 au into the heliotail. Simulation results are validated by multiple observational data sets. In particular, we show strong correlation of GCR fluxes with Voyager 1 observations before it ultimately crossed the heliospheric boundary and entered the LISM. Our SW-LISM interaction pattern is also in agreement with the anisotropy of 1-10 TeV CRs observed in air shower experiments. We also discuss the properties of the SW and LISM turbulence observed in situ by the Voyager spacecraft.

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