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Interaction of the solar wind with the interstellar medium: structure and implications for galactic cosmic rays

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The solar wind interacts with the local interstellar medium via both ionized and neutral gases. The primary coupling mechanism, charge exchange between protons and interstellar hydrogen, plays a critical role in determining the local structure, as does the interstellar magnetic field. We will describe the basic physical processes underlying the interaction between the solar wind and local interstellar medium, discuss the overall structure itself, with particular emphasis on magnetic structures in the inner heliosheath, the heliotail, and associated turbulence. We will also illustrate how IBEX measurements yield an estimate of the strength and orientation of the local interstellar magnetic field. Finally, we will illustrate the effect of heliospheric boundaries and structure on the entrance of galactic cosmic rays into the heliosphere.

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