

Solar Wind Interaction with the Local Interstellar Medium: Heliosheath and Heliotail Flows

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The Sun moves through the local interstellar medium (LISM) ejecting charged particles with velocities that eventually become greater than the fast magnetosonic velocity. A surface separating the LISM material from the solar wind (SW) plasma is called the heliopause. The SW is decelerated by the heliopause creating a heliospheric termination shock. A region of the SW plasma between the termination shock and the head of the heliopause is called the inner heliosheath (IHS). The LISM plasma is also decelerated by the heliopause creating a so-called outer heliosheath (OHS). The tail of the SW-LISM interaction region can be very long, extending to a few thousand astronomical units (AU). The LISM being partially ionized (about three times more neutral atoms than ions), charge exchange plays a major role in the heliospheric structure. I will describe the differences between purely MHD and MHD-neutral scenarios for different orientations and strengths of the interstellar magnetic field. The constraints on the LISM properties derived from the Interstellar Boundary Explorer will be discussed. The peculiarities of the SW plasma flow in the heliotail will be analyzed in the framework of a realistic model that takes into account solar cycle effects.

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