



Evolution of heliosheath ion distributions under charge exchange influence

Hans-Jörg Fahr, Horst Fichtner, Klaus Scherer, and Adama Sylla

University of Bonn, Argelander Institute for Astronomy, Astrophysics, Bonn, Germany (hfahr@astro.uni-bonn.de)

The evolution of the solar wind ion distribution downstream of the termination shock is considered under the influence of charge exchange interactions with cold interstellar H-atoms. Hereby we start out from a kinetic phase-space transport equation that takes into account convective changes, cooling processes, velocity space diffusion and charge-exchange induced ion-injection and -depletion. From this kinetic transport equation we ascend in moment hierarchy creating a so-called pressure transport equation that describes the evolution of the ion pressure in the flow-comoving rest frame. Hereby it is assumed that the local ion distribution can be approximated by a kappa-function with a streamline variable kappa parameter. This then allows to achieve an ordinary differential equation describing the parameter kappa as function of the streamline coordinate which can be solved. Finally one obtains the ion distribution function along every single streamline and can compare the results with Voyager measurements.