SECONDARY POPULATION OF INTERSTELLAR NEUTRALS seems deflected to the side

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Recently, the neutral hydrogen flow in the inner heliosphere was found to be deflected relative to the helium flow by about 4 degrees [Lallement et al., 2005]. The explanation of this delfection offered was a distortion of the heliosphere under the action of an ambient interstellar magnetic field. In a separate study, a number of data sets pertaining to interstellar neutral atoms, obtained with various techniques, were compiled and interpreted as due to an inflow of interstellar gas from an ecliptic longitude shifted by 10 - 40 degrees from the canonical upstream interstellar neutral flow direction at 254 degrees [Collier et al., 2004]. The origin and properties of such a flow is still under debate.We have performed a cross-experiment analysis of the heliospheric hydrogen and helium photometric observations performed simltaneously by the Nozomi spacecraft between the Earth and Mars orbit and explored possible deflection of hydrogen and helium flows with respect to the canonical upwind direction. For the interpretation we used predictions of a state of the art 3D and fully time-dependent model of the neutral gas in the heliosphere with the boundary conditions, ionization rates, and radiation pressure taken from literature. The model includes two populations of the thermal interstellar hydrogen, predicted by the highly-reputed Moscow Monte Carlo model of the heliosphere. The agreement between the data and simulations is not satifactory when one assumes that the upwind direction is the same for both populations, and identical with the direction derived from inerstellar helium observations. We discovered, however, that a much better agreement is obtained when the upwind direction of the secondary population, which in the Moscow model is created between the bow shock and the heliopause, is shifted from 254 to 234 degrees ecliptic latitude, while keeping the apex of the primary population unchanged. We also calculated the cases with the latitude of the secondry population 1.1, 5.6, 8.5, 11.7, and 14.9 degrees and concluded that such changes in the latitude of the secondary population have negligible effect on the results because the difference is hardly detectable in the Nozomi observations geometry. We have also investigated the interstellar neutral helium backscattered emission from the simultaneous data obtained from the XUV instrument on board Nozomi spacecraft and compared the results with the classical hot model and we conclude that the axis of the helium neutral flow is lying on 80/260 in ecliptic longitude. We conclude that Nozomi observations suggest that while the primary population of neutral interstellar hydrogen is flowing from the canonical upwind

direction, the secondary population, which originates between the bow shock and heliopause, is deflected by about -20 degrees in longitude. A deflection in latitude is not ruled out, but the observation geometry used in this study does not allow to confirm or reject it. The cause of this deflection seems to be a distortion of the heliospheric interface by the ambient magnetic field of the LIC.