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# Anisotropy of the distribution function of interstellar neutral helium inside the Earth's orbit

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The neutral component of the interstellar medium in which the Sun is embedded enters freely the heliosphere and can be detected by either direct or indirect methods from the Earth's orbit. The full-sky pattern of the flux of interstellar neutral (ISN) gas observed from inside of the heliosphere features two maxima. These two beams of the ISN gas are referred to as direct and indirect, respectively. Details of the local distribution function of the ISN gas (inside 1 AU) are important for analysis of the heliospheric backscatter glow and potentially also for details of the spectral flux of pickup ions. The heliospheric backscatter glow is due to the atoms that have radial velocities within the spectral range of the solar spectral line that illuminates the gas (Doppler dimming effect). In many studies it has been assumed that the local distribution functions of the direct and indirect beams of the ISN gas are isotropic. In our studies we verify this assumption for helium ISN gas. We show that in fact the distribution functions of direct and indirect beams in the inner heliosphere are anisotropic and can be approximated by a three-axial Maxwell-Boltzmann function. The thermal velocities along the axes strongly varying between each other as a function of the distance from the Sun and angle to the ISN gas inflow direction. We will discuss the characteristics of the temperature tensor of the ISN He gas separately for direct and indirect beams and present the conditions for which the approximation of the ISN gas beam by three-axial Maxwell-Boltzmann distribution function holds.