



CRA 2023

sixth Cosmic Ray Anisotropy Workshop

May 16-19, 2023
Loyola University - Chicago



Contribution ID: 46

Type: **not specified**

The IBEX Ribbon and its Relation to the Solar-Interstellar Interaction

NASA's Interstellar Boundary Explorer (IBEX), an Earth-orbiting Small Explorer spacecraft, measures energetic neutral atom (ENAs) produced primarily by charge exchange in the outer heliosphere. There are two main sources of ENAs. The first, called the "globally distributed flux", is formed from neutralization of interstellar pickup ions that were preferentially accelerated at the heliospheric termination shock and advected with the bulk plasma flow through the inner heliosheath. Once these ions experience charge exchange, they may travel back towards in the inner heliosphere and be detected by IBEX. The second main source, called the "Ribbon", is a narrow enhancement of ENA emissions circling the sky that come from outside the heliopause. It is widely believed that the Ribbon is ordered by the draping of the local interstellar magnetic field (ISMF) around the heliosphere and has allowed us to pinpoint the pristine (far from the heliosphere) ISMF strength and orientation. I will present a review of Ribbon modeling studies that analyze the relationship between the Ribbon and the draped ISMF, the importance of understanding particle pitch angle scattering outside the heliopause, and the evolving solar wind that serves as the primary source of the Ribbon flux through the secondary ENA process.

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