

Determination of the Abundances of Polar Jets using Hinode/EIS and an Investigation of the Relationship with the Fast Solar Wind

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With X-ray observations, we can find many jets caused by reconnection in the Sun's polar region, and they are thought to be a fast solar wind source. The ejected plasma along the jets can contribute mass to the solar wind. From the in-situ measurements in the magnetosphere, it has been found that the fast solar wind has photospheric abundances while the slow solar wind has coronal abundances. Therefore, we investigated the abundances of polar jets to determine whether they are the same as that of the fast solar wind. For this study, we selected jets in the polar region observed by Hinode/EIS and XRT simultaneously on 2007 November 3. We calculated the FIP bias factor from the ratio of the intensity between high (S) and low (Si, Fe) FIP elements using the EIS spectra. The values of the FIP bias factors for the polar jets are around 0.7~1.0, which indicates that they have photospheric abundances similar to the fast solar wind. The results are consistent with the reconnection jet model where photospheric plasma is rapidly ejected into the fast wind.