

IMF clock angle control of the cusp injection region

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The Low Energy Neutral Atom (LENA) imager on the IMAGE spacecraft in the dayside magnetosphere can detect neutral particles that are emitted by the cusp ion injection via charge-exchange with the Earth hydrogen exosphere. We examined LENA cusp signal events from the noon-midnight passes of IMAGE for which the solar wind speed is relatively constant and IMF is generally aligned with the dawn-dusk direction, i.e., large B_y conditions. One of these events includes simultaneous observations with the Polar spacecraft near the high-altitude cusp, indicating that the multiple enhancements of the LENA cusp signal are actually caused by the multiple ion injections. Results of analyses show that the IMF tilting of as small as about 10 degree around the dawn-dusk direction produces the significant change of the LENA cusp signal in such a manner that the signal tends to intensify and expand with the increase of the magnitude of the clock angle. Results also suggest that the exact relation of such a tendency depends on the dawn-dusk position of the observation. These results will be discussed in terms of the IMF B_y -dependent cusp injection region and the LENA's field-of-view relative to the injection region.