

コロナホール流に伴う放射線帯外帯電子の発達：あらせ観測

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Evolutions of energetic electrons associated with the coronal hole streams: Arase observations

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Large flux enhancements of relativistic electrons of the outer belt often observed associated with the high-speed coronal hole streams. Both the solar wind speed and the southward IMF are important parameters to control the flux enhancement of electrons. Previous studies have shown that the flux of enhanced electrons largely depend on the solar wind parameters, while the solar wind parameter dependence of the evolution of the energy spectrum, especially highest energy, have not been well known. In this study, we investigate evolutions of the energy spectrum during the high-speed streams after the Arase launch by using the energetic electron data from Arase/XEP/HEP/MEPe instruments. As a result, the hardening of the energy spectrum depends on the southward IMF after the stream interface crossing. Average heating rate of ~20-30 keV/days at the heart of the outer belt are found from the analysis during the high-speed streams, and the heating rate depends on the southward IMF. During the periods, continuous chorus wave enhancements are observed outside the plasmopause during the same periods, which suggests that chorus waves contribute to heating of energetic electrons.