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Simulation on the IMF Bz control of the whistler mode wave excitation associated with the high-speed

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The outer belt electron flux tends to increase largely during the high-speed coronal hole streams. The flux enhancements depend on not only the solar wind speed but also the IMF Bz; the southward-dominant streams (SBz-HSS) cause the large flux enhancement rather than the northward-dominant streams (NBz-HSS) [Miyoshi and Kataoka, 2008]. Considering the acceleration process via whistler-wave particle interactions, key parameters including hot electrons, plasmasphere, and whistler mode waves should have similar differences between SBz/NBz-HSS, and we have confirmed these differences by the statistical analysis. In this study, we will simulate the relativistic-RAM electron model [Jordanova and Miyoshi, 2005] to confirm these parameter dependences on the key parameters. Firstly, we prepared the superposed LANL/MPA data about SBz/NBz-HSS as a boundary condition at L=6.6 to model the differences of the plasma sheet between SBz/NBz-HSS. In the SBz-HSS, we observe enhancements of hot electrons of ~30 keV and lower-band whistler mode waves around L=4 at dawn-side. On the other hand, in the NBz-HSS, the enhancements of ~30 keV electrons and whistler mode waves are observed at $L>5$. These differences primarily come from the magnetospheric convection. The betatron acceleration of the convective transport is the main driver to generate the whistler mode waves. We found that the plasma sheet temperature in the SBz-HSS is higher than that in the NBz-HSS, but the differences of the plasma sheet temperature do not cause clear differences of the whistler mode wave excitation between SBz/NBz-HSS.

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