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放射線帯外帯に対するサブストームのインパクト
Direct impact of substorm on outer radiation belt

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We use a four-dimensional drift kinetic simulation coupled with a global magnetohydrodynamics (MHD) simulation to investigate the direct impact of a substorm on relativistic electrons in the heart of the radiation belt. During the substorm growth phase, energetic electrons moved earthward from the plasma sheet because the dawn-dusk convection electric field overcame the dusk-dawn induction electric field. During the expansion phase, energetic electrons traversed the quasi-trapping region and encountered the stable trapping region due to persistent and variable electric field, which is dominated by the westward component on the nightside. Finally, relativistic electrons initially located at L~4 were replaced by newly injected ones within 1 hour. We will discuss the generation mechanism of the persistent and variable electric field that appear during the expansion phase and formation of the outer radiation belt.

キーワード: 放射線帯, サブストーム, 電子, 内部磁気圏
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