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低緯度境界層形成に対する運動論的アルヴェン波の寄与
Contribution of kinetic Alfven waves to the formation of the low-latitude boundary layer

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One of the biggest problems in magnetospheric physics is to understanding how the solar wind plasma enters the magnetosphere and forms the low-latitude boundary layer (LLBL) during northward interplanetary magnetic field periods. Several processes have been suggested including: (1) magnetic reconnection at the poleward-of-the-cusp in both hemispheres, (2) reconnection or turbulence within well-developed Kelvin Helmholtz vortices on the flank magnetopause, and (3) diffusive transport induced by wave-particles interactions.

Regarding the third process, we revealed from test particle simulations that transverse and compressional fluctuations via kinetic Alfven waves (KAWs) can cause selective transport associated with their perpendicular wavelengths. Applying the results to a magnetopause crossing event in which the existence of the KAWs had been identified, we successfully found that KAWs can actually transport solar wind plasma across the magnetopause. In this presentation, we will show applications to various magnetopause-crossing events and discuss whether the KAWs can contribute to the formation of the LLBL.

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