

Deformation of electron pitch angle distributions caused by chorus waves observed by the Arase satellite

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We report on deformation of electron pitch angle distributions associated with chorus waves observed by the Arase satellite. The deformation is characterized by flux increase of 17-30 keV electrons in a narrow and oblique pitch angle range and by flux decrease in 7-17 keV electron flux in the smaller pitch angle range than the flux increase. Comparison of change in electron pitch angle distributions with resonant ellipses of the upper band chorus shows that the deformation appears where effective wave-particle interaction is expected in the velocity space, and the flux increase takes place along the resonant ellipse of the upper frequency of the wave. This strongly suggests that the deformation is a consequence of wave-particle interactions between electrons and upper band chorus. The Arase observation demonstrates that the deformation occurs within 30 s, which is faster than expected from the quasi-linear diffusion theory.

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