

## Strong diffusion of energetic electrons into diffuse aurora

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Diffuse aurora is believed to be caused by pitch angle scattering of electrons by electrostatic electron cyclotron harmonic (ECH) waves and whistler chorus waves at the magnetospheric equator. However, precipitating electrons have not been identified in the magnetosphere, where the loss cone angle is a few degrees. Here we present a new observation of electrons inside the loss cone in the magnetosphere. During a storm-time auroral event on 17 July 2017, we found two types of diffuse-auroral type precipitating electrons, both of which are in the strong diffusion state. While one type is attributed to the scattering by upper-band chorus waves, the other type could be caused by ECH waves or lower-band chorus waves. The calculated energy flux of 7 &#211; 30 keV is a few ergs/cm<sup>2</sup>-s, illustrating these hot electrons can substantially contribute to diffuse aurora at lower altitude, while softer electrons would simultaneously generate higher-altitude diffuse aurora.