Correlations of low-energy electrons with chorus emissions observed by ERG: An event study

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Interactions between electrons and chorus emissions have been studied by spacecraft in-situ observations, and in this study, we report close relations of electrons with energies below ˜20 keV to upper-/lower-band chorus emissions observed by the ERG satellite late on March 18, 2017. ERG was located in the post-midnight at L˜6, crossing the magnetic equator. Around 23:45UT, the satellite observed an electron injection and chorus wave intensification. The observation indicates good correlations of field aligned electron fluxes to both upper-band and lower-band chorus emissions and also relatively low correlation coefficients in between those bands. Moreover, electron energy distributions have a dip at the band gap. These results suggest that in this event, low energy electrons were being scattered by upper- and lower-band emissions simultaneously toward the magnetic field directions by cyclotron resonance, resulting in less increase of parallel electron fluxes at the upper-lower band gap.