Auroral activities in simultaneous ATV, imaging riometer, and VLF observations at Syowa Station: A case study on 17 May 2007

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Energetic electrons precipitated into the atmosphere through pitch angle scattering due to wave-particle interaction cause auroral brightness. Pulsating aurora especially consists of modulated energetic electrons from a few to several tens of keV with pulses of a few seconds to a few tens of seconds [e.g., *Nishiyama et al.*, 2011, *JGR*]. Previous studies of pulsating auroral luminosity show a clear correlation with chorus emissions [e.g., *Nishimura et al.*, 2010, *Science*]. However, a detailed correlation study between auroral luminosity, energetic electron precipitation, and chorus emissions has not been performed. In this study, we focus on the process of auroral brightness through wave-particle interaction. We examine characteristics of auroral luminosity by all-sky TV, energetic electron precipitation, and chorus emissions observed at Syowa Station in Antarctica. During the pulsating auroral events on 17 May 2007. We use the Cosmic Noise Absorption (CNA) data from the imaging riometer which is sensitive to electron precipitation at several tens of keV. An enhancement of distribution of energetic electron precipitation is detected after ~02:53 UT on 17 May 2007. The enhancements of energetic electron precipitation roughly show a correlation with enhancements of chorus emissions and all-sky TV camera. We show characteristics between auroral luminosity, energetic precipitation, and VLF wave activity.