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Strong triggered electromagnetic emissions observed by DEMETER during the November 2004 magnetic storm

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DEMETER is an ionospheric micro-satellite which is on a polar orbit at an altitude of 710 km. Its scientific payload allows to measure electromagnetic waves and plasma parameters. During the strong magnetic storm which occurred between the 8th and 10th of November 2004 (Dst = - 400 nT on November 8th), intense emissions have been recorded. This paper presents a part of the emissions which have been observed at mid-latitudes in a frequency range between 500 and 2000 Hz. They are observed on consecutive orbits, either in one hemisphere or in both hemispheres. The time resolution of the onboard computed spectrograms is two seconds and the frequency resolution is 19.5 Hz. On these spectrograms these waves look like disseminated patches without structures. But when waveforms are available during a burst mode, it appears that these emissions are composed of a set of lines slowly drifting in frequency with the time. In a single event, the emissions appear in several frequency bands which are equidistant. The occurrence of all these emissions is studied in relation with the energetic particle flux which is measured onboard DEMETER to check the interaction between waves and particles through the cyclotron resonance mechanism.