Pc 5 waves simultaneously observed by GEOTAIL and HF radars in collaboration with the EISCAT Heater experiment on January 17, 2002

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The GEOTAIL and SuperDARN collaborative observations of ULF wave have been carried out several times since 1998 in order to investigate the propagation mechanism of waves from space to the ground through the ionosphere. However, there is some difficulty for this kind of coordinated observations. We may see nothing in the ionosphere without effective radar echo, even if good event is observed by GEOTAIL of which footprint is passing over the radar's field of view. We need ionospheric irregularities always to get good radar echo and information of wave characteristics in the ionosphere. To get higher success rate of the coordinated observation we have proposed an additional collaborations with the EISCAT Heater experiment, which could produce artificial irregularity in the ionosphere. The EISCAT Heater is located at Tromso, Norway under the field of view of the CUTLASS HF radars.

The day of January 17, 2002 was selected as the first collaboration of GEOTAIL, SuperDARN, and EISCAT Heater experiment. The footprint of GEOTAIL was passing near Tromso on this day, and the heater was turned on during 13-16 UT. Transverse and compressional Pc 5 waves were observed successively by GEOTAIL in the dusk side magnetosphere during 14-18 UT, and the CUTRASS Radars observed ionospheric oscillations with the same frequency. We report the initial results from this unique coordinated observation.