



Unknown radio emission at about 3 MHz recorded in Norway

T. Farges (1), E. Blanc (1), and E. Strand (2)

(1) CEA, DAM, DIF, France (thomas.farges@cea.fr, 0033 169267130), (2) Østfold University College, Norway

A wideband electric field antenna has been installed in Norway (at Hessdalen, 62°41' North and 11°12' East). A signal of 50 ms is automatically recorded every 5 s in order to monitor the spectral variations from 1 kHz to 5 MHz. Signals have been acquired during more than one year from September 2010 to December 2011. The measured electromagnetic spectrum is very similar to other spectra commonly measured in other places in the World. It shows emissions in numerous bands at fixed frequencies corresponding to radio transmissions in VLF, LF, MF and HF bands. However, one emission is quite different and arouses our curiosity. We find a quasi-continuous radio emission at a frequency varying from 2.7 to more than 3.4 MHz with a mean value of 3.0 MHz. The bandwidth is quite large (about 40 kHz) while it is about 9 kHz for all the other radio emissions at frequencies higher than 100 kHz. During the night, the frequency is relatively stable at about 3.1 MHz while during day-time a frequency shift of 200-300 kHz is often observed. These variations can be quick (few tens of minutes) or slow (several hours). Moreover, the emission disappears during day-time, the disappearance duration depending on the daylight duration. From November to the end of March, there is almost no disappearance while in April disappearances are more frequent and longer. From May to July, the emission disappears systematically during day-time from 6:00 UT to 20:00 UT. At the sunrise time the emission frequency suddenly decreases and systematically disappears when it reaches a threshold value (from 2.7 to 2.85 MHz). The emission (frequency and duration) is not influenced by the magnetic storms. We will show in the paper statistical results and some hypothesis on the mechanism which can produce this radio emission.