# Spectral resonance structures with frequency separation of 0.2 Hz detected at Kawatabi, Miyagi, Japan

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Spectral resonance structures with narrow frequency separations of 0.2 Hz were found in the ELF magnetic field data obtained at Kawatabi, Osaki, Miyagi prefecture Japan (magnetic latitude N30, L=1.35), in addition to those with wider frequency separation around 0.625 Hz [1]. The data were obtained by an induction magnetometer placed in North-South direction at a sampling frequency of 128 Hz. The data were Fourier transformed every 128 second in order to obtain high-frequency resolution spectra. Figure 1 shows an example. We can see structured enhancements during the period from 20:00 JST to 05:30 JST. At 23:30 JST, there are 18 stripes in the frequency range between 0.5 Hz and 4 Hz, thus the separation between the harmonics is 0.2 Hz. In the previous literatures, the spectral resonance structures with large frequency separation (df=0.5 - 1 Hz) were found at high latitudes, while those with small frequency separation were found in low latitudes: df=0.12 Hz at the island of Crete (L=1.3) [2], 0.2 - 0.275 Hz at Muroto (L=1.206) [3], or 0.3 - 0.4 Hz Shillong (L=1.08) [4]. At Kawatabi, the spectral resonance structures with narrow frequency separation was found in 59 days out from 963 days in 2001, 2006, and 2010 - 2012 examined. The occurrence rate 6% is nearly the same or slightly higher than those of wider frequency separation events observed at the same site. they did not always coexist with wider separation structures. The occurrence rate was higher (8.6%) in 2006 (near solar minimum) while lower (5.6%) in 2001, near the solar maximum. They were detected only on nighttime (Local Time 18 - 05) in accordance with previous literatures.

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