

Quasi-periodicity of solar type III radio bursts

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Fine structures of type III solar radio bursts in the decameter wavelength range from 15 MHz to 40 MHz have been investigated based on the Wideband Dynamic Polarimeter (WDP) system at Tohoku University Iitate observatory.

Type III solar radio signals which are received by two sets of orthogonal log periodic antenna are converted into left and right handed polarized signals. Finally, radio spectra from 15 MHz to 40 MHz are obtained every 500 msec by the swept-frequency polarimeter.

As a result, we have identified the periodicity of about 10 sec in the spectrogram of type III solar radio bursts. The occurrence probability of these phenomena is about 30 %. The intensity variation of the quasi-periodic radiation is in a range of 10 dB with a period about 10 sec.

The generation mechanism of this radio emission is expected to be due to the field-aligned electron beams near the region of about 3 solar radii in the solar corona with a period about of 10 sec. It is inferred that ion waves may be the origin of the field-aligned electric fields to emit the electron beams.