

Interactive comment on “Unknown high-frequency (7–12 kHz) quasi-periodic VLF emissions observed on the ground at $L \sim 5.5$ ” by Jyrki Manninen et al.

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We thank both referees for their valuable and interesting comments. We appreciate very much that they were willing to spend their time helping us to improve our paper. We did our best to use all the comments and suggestions to improve the manuscript.

- We have changed ‘Unknown’ to ‘New’ in the title as it was recommended by Ref.#1.
- We have corrected everywhere the upper frequency to ‘12 kHz’.
- The end of the emission is not a consequence of the filtering method. Unfortunately, we could not find a plausible source of such strong signal rejection. Some speculation could be attributed to a sudden drop of the flux of trapped electrons at the geomagnetic flux tube, where the wave-particle interaction is taking place.

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- A possible explanation why the second set of “bullets” is only observed at lower frequencies could be that it is as a result of a time-shift of the wave generation region to higher L-shells.

- According to Ref.#2 comments, we added in the text (page 5) an explanation why we suggested that the studied QP emissions could be related to auto-oscillation of the cyclotron instability in the magnetospheric plasma-maser. The studied QP events did not accompanied by ULF magnetic pulsations with any period comparable to the modulation period of QP emissions. So, a possible generation mechanism of such QP event could be the periodic wave generation in the relaxation oscillations of the cyclotron instability of the Earth radiation belts in the magnetospheric plasma maser (Bespalov and Trakhtengerts, 1986, Trakhtengerts and Rycroft, 2008). This model was also applied to explain some satellite observations of QP emissions (Pasmanik et al., 2004).

- The size of the ionospheric exit points is not possible to determine with only two-component (magnetic NS and EW) receiver. We would need either the third component (Z, electric) or one or two similar receivers within a couple of hundreds of kilometres from KAN based on the polarisation and ellipticity of the waves.

- All technical corrections have been made according to referees’ suggestions.

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