The Broad Upshifted Maximum is one of the prominent features of the Stimulated Electromagnetic Emission (SEE) excited in the ionosphere pumped by powerful HF radio waves. BUM exists when $f_0 \gtrsim sf_e$ ($s = 3..7$) and occupies quite wide frequency range above the pump wave frequency f_0 from f_0 +10-12 kHz till f_0 +100-150 kHz, f_e is the electron cyclotron frequency. The BUM peak frequency f_{BUM} approximately follows the empirical relation $f_{\mathrm{BUM}} - f_0 \approx f_0 - sf_e$. The high frequency flank of the BUM (above the BUM peak frequency) commonly exhibits an exponential power spectrum decreasing towards higher frequencies. This dependence suggests that the plasma waves, responsible for the BUM are excited by a parametric four-wave interaction 2PW →UH+EB (2 pump wave quanta transform to Upper Hybrid quant at the BUM frequency and Electron Bernstein quant at $\approx sf_e$. Also, the lower hybrid (LH) oscillations participate in the process.

The fully adequate theory of the BUM is not constructed yet, despite of the BUM id observed during approximately 45 years.

The author suggests that the LH oscillations are localized in a small-scale cylindrical density depletion in the plane perpendicular to a homogeneous and static geomagnetic field. They form cylindrical modes characterized by the frequency, an azimuthal mode number and radial wave number. The localized LH modes are associated with multi-cell plasma drift patterns. For sufficiently strong driving fields, the time signal of the LH electron and ion density fluctuations at a fixed position in the simulation plane exhibit an approximately exponential power spectrum, thereby being evidence of deterministic chaos. The exponential spectrum is connected to pulse-type features of Lorentzian form in the time signal.

The author suggests that the LH oscillations with the exponential power spectrum can be responsible for the exponential power spectrum of the UH waves, and therefore, for the BUM exponential power spectrum.

The idea and its demonstration in numerical simulation is look quite interesting. In my opinion, the paper should be published as it is.

But the author writes that the present simulation results are not totally consistent with the experimental results. So, it the efforts are required for further development of the idea.

Sincerely< Savely M. Grach