Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Parametric Antenna Concept for Efficient Very Low Frequency (VLF) Wave Excitation[1] T. KIM, V. SOTNIKOV, Air Force Research Laboratory, Wright-Patterson AFB, OH 45433, E. MISHIN, Air Force Research Laboratory, Kirtland AFB, NM 87117, T. GENONI, D. ROSE, Voss Scientific Inc, Albuquerque, NM 87107 — Concept of a parametric antenna in the ionospheric plasma is analyzed. Such antennas are capable of exciting electromagnetic radiation fields, specifically the creation of whistler waves generated at the very low frequency (VLF) range, which are also capable of propagating large distances away from the source region. The mechanism of whistler wave generation is considered a parametric interaction of quasi-electrostatic low oblique resonance (LOR) oscillations excited by conventional antenna. The transformation of LOR waves on quasi-neutral density perturbations in the near field of an antenna gives rise to whistler waves on combination frequencies. Amplitude of these waves can considerably exceed the amplitude of whistler waves directly excited by a loop. Simulation to demonstrate excitation and spatial structure of VLF waves excited by a loop antenna using a PIC code LSP will be presented as well.

[1]This work was supported by the Air Force Research laboratory.

T. Kim
Air Force Research Laboratory, Wright-Patterson AFB, OH 45433

Date submitted: 07 Jul 2014 Electronic form version 1.4