

Abstract Submitted
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Comparison of Electric Dipole and Magnetic Loop Antennas for Whistler Generation in the Inner Magnetosphere¹ KEVIN SHIPMAN, PATRICK COLESTOCK, QUINN MARKSTEINER, GIAN LUCA DELZANNO, BRUCE CARLSTEN, Los Alamos National Laboratory, MARK GILMORE, University of New Mexico — There has been much interest over the years in the use of very low frequency (VLF) whistlers in the inner magnetosphere for remediation of trapped MeV electrons in the Van Allen belts. In preparation for future satellite-borne experiments, it is essential to differentiate the best antenna design to generate whistler modes in the magnetosphere. The two simplest and most studied antennas are an electric dipole and a magnetic loop antenna. It is well known that a loop antenna is much better at radiating whistlers than a dipole, but a dipole is easier to deploy in space especially when antenna dimensions have to be large for VLF wave generation. This study compares the performance between the two antennas which are modeled in a cold magnetoplasma. The radiation resistance, the efficiency of whistler generation, radiation patterns, and effective antenna dimensions are compared for any orientation of both antennas with respect to the magnetic field and over a range of altitudes.

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