

Abstract for an Invited Paper
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Plasma Experiments and the Environment¹

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Laboratory and Field experiments demonstrate nonlinear interactions of Electromagnetic waves and plasma waves in the presence of free energy sources. Viewing the earth's atmosphere immersed in a magnetic mirror, a number of environmental remediation concepts are presented. Waves at ion cyclotron frequencies injected into an auroral ionosphere are used to selectively excite ion species and eject them out through the "magnetic field cusp". The roles of the parametric decay instabilities and the auroral kilometric radiation in the presence of electron and ion loss cone distributions are considered in the presence of solar wind and radiation. There is sufficient convection of CO and CO₂ throughout the atmosphere for the sequestration of greenhouse gases in geospace. Active experiments with atmospheric platforms are presented to illustrate how charge-neutral coupling enhances transports from lower to upper atmosphere.

References: Wong, A. Y. , J. Chen, L. C. Lee and L. Y. Liu , Phys Rev Lett.102, 105002 (2009); Leyser, T.B. and A, Y, Wong , Rev. Geophys. 47, RG1001 (2009).

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