



## Nonlinear electrostatic waves in the auroral plasma

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Nonlinear electrostatic waves have been observed in different regions of the Earth's magnetosphere by various satellites over the past few decades. In this talk, theoretical models developed over the years and applicable to auroral plasmas will be reviewed. As a specific application to observations in auroral plasmas, a theoretical model to study nonlinear electrostatic waves in a two-component magnetized plasma comprising of cold ions and suprathermal electrons following  $\kappa$ -distribution will be analyzed. The nonlinear electrostatic waves are considered to be propagating at an oblique direction to the ambient magnetic field. The impact of initial driving electric field amplitude, wave Mach number, spectral index  $\kappa$ , propagation angle and ion drift velocity and various other plasma parameters on the evolution and the existence domain of nonlinear electric field structures is carried out. Through this plasma model electrostatic ion cyclotron and ion acoustic waves are generated. Further, results from previously existing

model(s) with the theoretical model developed here will be compared vis a vis observations in auroral region by the FAST satellite.

### References

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