2008 Fall Meeting
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Your query was:
"Ng, C"

HR: 0800h
AN: **NG31B-1199**
TI: 3D BGK Modes in Finite Magnetic Field as Electrostatic Solitary Waves in Space Plasmas
AU: * **Ng, C**
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AB: There has been renewed interest in the theory of Bernstein-Greene-Kruskal (BGK) modes, motivated by recent identifications of electrostatic solitary waves in space plasmas from spacecraft such as Geotail, Fast, Polar, Cassini, and Cluster. To fully account for theses observations, the classical one-dimensional (1D) BGK mode theory is insufficient. While 1D BGK theory is quite mature, there appears to be no exact 3D solutions in the literature, except for the limiting case when the magnetic field is infinitely strong [Chen et al., Phys. Rev. E 69, 055401(R) (2004)], as well as 3D BGK modes with zero magnetic field [Ng & Bhattacharjee, Phys. Rev. Lett., 95, 245004, 2005], and 2D BGK modes with finite magnetic field [Ng, Bhattacharjee & Skiff, Phys. Plasmas 13, 055903 (2006)]. Here we construct approximate 3D BGK modes in finite magnetic field with approximations characterized by explicit parameters so as to show that they tend to the infinite-field solutions. Width-amplitude relation of such BGK modes, as well as the spatial electric field structures, will be compared with observations.
DE: 2772 Plasma waves and instabilities (2471)
DE: 4455 Nonlinear waves, shock waves, solitons (0689, 2487, 3280, 3285, 4275, 6934, 7851, 7852)
DE: 7815 Electrostatic structures
DE: 7839 Nonlinear phenomena (4400, 6944)
DE: 7852 Solitons and solitary waves (4455)
SC: Nonlinear Geophysics [NG]
MN: 2008 Fall Meeting

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