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Simulation of electron nongyrotropy in the Earth's bow shock

Moraes, M. A. E. ^{1,2}, Alves, M. V. ¹

¹*Instituto Nacional de Pesquisas Espaciais (INPE) - Av. dos Astronautas, 1758 - Caixa Postal:515 - Cep.:12227-010 São José dos Campos - S.P. - Brasil,*

²*Universidade de Taubaté â UNITAU, Taubaté â SP, Brasil*

Investigating Particle distribution function is an important way to understand the phenomena occurring in the magnetoplasma. For several years, it has being extensively studied in the plasma environment. A greater number of them, investigate distribution function of the type $f(v_o, v_1)$, where the velocities occur both parallel (v_o) and perpendicular (v_1) to the background magnetic field. This kind of distribution is symmetric related to the magnetic field, and is termed gyrotropic. When the distribution is not symmetric, i.e. the particles are bunched, becomes gyrophase dependent or nongyrotropic. In a recent paper was presented a sustained signature of a gyrophase-bunched electron distribution just upstream of the Earth's bow shock (Gurgiolo et al., 2000). Based on these observations, we use particle simulation to study the instabilities enhancements and stimulation of electrostatic and electromagnetic wave growth due the electron nongyrotropy in the Earth's bow shock.

Keywords: **electron gyrotropy, bow shock, magnetoplasma, magnetic field**

Corresponding author's e-mail: