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Effect of Ion Pressure Anisotropy on Solitary Waves in a Multi-Ion Plasma

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Using Reductive Perturbation Technique (RPT), the Zakharov-Kuznetzov (ZK) equation is derived for ion acoustic solitary waves in a multi component magnetized plasma consisting of hydrogen ions, both solar and cometary origin of electrons and positively and negatively charged heavier pair ions. Both electron components are modeled by Kappa distribution functions. The Chew, Golberger-Low (CGL) theory[1] has been included in the derivation to study the combined effect of anisotropic pressure of lighter hydrogen and heavier pair-ions.[2,3] Various combinations of the anisotropy of the three types of ions have been considered in the numerical study. From the plots, it is seen that different anisotropy effects of both heavier and lighter ions influences differently the solitary structures supported by the plasma.

References

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