



Decay of Langmuir Wave in Earth's magnetosphere with non-uniform magnetic field

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The parametric decay instability of upper hybrid wave into low-frequency electromagnetic Shear Alfvén wave and Ordinary mode radiation has been investigated in electron-ion magneto-plasmas with gradient in ambient magnetic field. The gradient of magnetic field creates the gradient in density of plasmas. Earth's magnetosphere has this type of plasma environment in which magnetic field and density both have gradients in both parallel and perpendicular to the external magnetic field. The fluid model has been used to investigate the linear and nonlinear response of the plasma species for three-wave coupling in magneto-plasmas. It is shown that the gradient in magnetic field generates the gradient in density by drifting the plasma species and this gradient has considerable effect on the growth rate of three-wave interactions in Earth's magnetosphere plasma.

References

- [1] G. Brodin, M. Marklund, and G. Manfredi, Phys. Rev. Lett. **100**, 175001 (2008).
- [2] M. Shahid, D. B. Melrose, M. Jamil, and G. Murtaza, Phys. Plasmas **19**, 112114 (2012).
- [3] G. Murtaza and P. K. Shukla, J. Plasma Physics **31**, 423 (1984).
- [4] H. Saleem, M. B. Chaudhry, G. Murtaza, and P. K. Shukla, Phys. Fluids **28**, 3 (1985).
- [5] L. D. Landau and E. M. Lifshitz, Statistical Physics. Part I (Pergamon, Oxford, 1978).
- [6] Zhengwei Wu, Haijun Ren, Jintao Cao, and P. K. Chu, Phys. Plasmas **15**, 082103 (2008).