3D-Kinetic Alfvén Wave Turbulence and Formation of Localized Structures in the Magnetopause Region

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Abstract In the present paper, nonlinear interaction between three dimensionally propagating kinetic Alfvén wave and perpendicularly propagating magnetosonic wave has been studied for the high-β plasma $(\beta \sim 1)$, applicable to magnetopause region. A set of non-dimensional dynamical equations has been derived taking the ponderomotive nonlinearity into account, which is further studied under paraxial as well as non-paraxial approximations. Formation of localized structures and energy transfer in smaller scales has been investigated. The results obtained from the numerical simulation are found to be quite consistent with the results reported from the analysis of the data recorded by the THEMIS spacecrafts.

Keywords

Kinetic Alfvén wave, Magnetosonic wave, Magnetopause region.