



Generation of Kinetic Alfvén Waves in the magnetosphere

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Kinetic Alfvén waves appear as broadband enhancements in electric and magnetic field wave power that become increasingly electrostatic at higher frequencies. These waves have been reported inside the plasmasphere in conjunction with, and modulated by, ultralow frequency (ULF) oscillations driven by an impulsive solar wind pressure enhancement and are identified as Doppler-shifted kinetic Alfvén waves. Further, KAWs may significantly impact particle dynamics in the inner

magnetosphere through enhanced ion transport and heating. In this talk, we will discuss generation of kinetic Alfvén waves excited by the free energy sources such as ion beams and velocity shear in the solar wind-magnetosphere multi-component plasmas. Nonthermal particle distributions such as kappa-distributions which are frequently observed in space plasmas will be used. Application of the theoretical model will be shown for the generation of ULF waves in the Earth's magnetosphere.