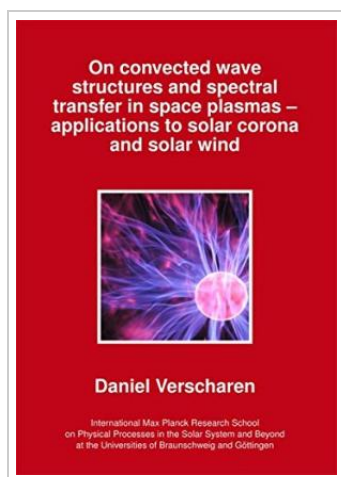



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On convected wave structures and spectral transfer in space plasmas

By Daniel Verscharen

Uni - Edition GmbH März 2012, 2012. Taschenbuch. Condition: Neu. Neuware - Alfvén/ion-cyclotron waves are important normal modes in a plasma. Their existence can explain several observed features in space plasmas such as temperature anisotropies and preferred heating of certain ion species in the solar corona and the solar wind. The properties of this wave mode and different aspects of the spectral transfer of wave energy in wavenumber space are analyzed. The way Alfvén/ion-cyclotron waves shape a particle distribution function is treated with kinetic methods in an analytical model, and an additional observational effect in particle measurements is found. The nature of the important Alfvén/ion-cyclotron mode is discussed in a multi-fluid analysis. A derived system of differential equations is used to analyze the dispersion properties of weakly-compressive high-frequency waves, which are superposed on a low-frequency Alfvén/ion-cyclotron wave. In a certain parameter range, a wave instability is found, which can be interpreted as a linear spectral transfer process due to the nonuniform background of the low-frequency wave. As a particular example for a nonlinear spectral transfer process, the parametric decay is treated in a two-dimensional numerical study using a hybrid code. The same code is then used to analyze the spectral...



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