

[CS11] Effects of collisions on Alfvén wave heating

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Alfvén waves play an important role in delivering ambient energy into magnetic flux such as at the coronal loop or the Earth's field line resonance. Below the solar transition region, neutral particles are dominant compared to the charged particles, which invalidates the condition of ideal MHD. In this study, we show how Alfvén wave heating theory is altered by the inclusion of neutral particles. We calculate the efficiency of Alfvén wave heating below the transition region and compare with the resonant absorption at the higher altitude.

[CS12] Mode conversion of Langmuir waves into ordinary electromagnetic waves in an inhomogeneous warm plasma

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It is known that electrostatic Langmuir waves, which are often associated with solar radio bursts, are generated near the shock front.

It was previously suggested that they can be converted to the ordinary electromagnetic waves through the mode conversion. By adopting the Invariant Imbedding Method (IIM), we calculate accurate values for the reflection and mode conversion coefficients of Langmuir and o-mode waves in an unmagnetized inhomogeneous plasma with a finite temperature. We investigate the mode conversion and its inverse conversion between the two modes, and also verify whether the reciprocity principle is conserved or not in such cases.