Geophysical Research Abstracts, Vol. 7, 06502, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06502

Damping of vertical coronal loop kink oscillations through wave tunneling

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The decay rate of vertical kink waves in a curved flux tube is modeled numerically. The full MHD equations are solved for a curved equilibrium flux tube in an arcade geometry and the decay of $|\vec{V_{perp}}|$, the integral of the modulus of the velocity perpendicular to the local magnetic field over the flux tube, is measured. These simulations are 2D and are thus restricted to kink oscillations in the loop plane. The decay rate is found to increase with increasing wavelength, increasing β and decreasing density contrast ratio and is shown to be consistent with the recent observations of kink oscillations in the loop plane.