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How are the energetics of transverse waves in a coronal loop affected by a transition region?

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Transverse waves of a coronal loop, also known as kink waves, are commonplace in the solar atmosphere, both in their standing and propagating form. Such waves may be important in the energy + mass cycles of the solar corona. Furthermore, recent numerical studies of coronal loops have shown that the plasma heating from dissipation of these waves is sufficient to overcome radiative cooling. However, the addition of a dense mass reservoir at the end(s) of the loop in the form of a chromosphere and transition region can alter the energetics of the wave and its evolution compared to a purely coronal loop.
In this talk, I will outline current progress in 3D MHD simulations of a solar loop incorporating a chromosphere, transition region and coronal component in a stratified, thermally conducting atmosphere. Transverse waves are induced from a driver in the chromosphere, showing these waves are able to penetrate the transition region. This result is important for the decay-less oscillation regime, in which very small amplitude transverse oscillations are seen to persist for many periods, despite the (presumable) action of damping mechanisms such as resonant absorption. The fact that decay-less oscillations may be driven down in the chromosphere supports the notion that decay-less oscillations are powered from below.
When the loop is sufficiently driven, the motion of the coronal plasma leads to small scales generated from Kelvin Helmholtz instability eddies, and these deformations are regions of enhanced heating. I will discuss the simulation results on how the wave energy is dissipated into heat; the relationship between the driver and the heating; and the extent to which the entire loop is heated, and compare with the purely coronal case.