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(When) Can wave heating balance optically thin radiative losses in the corona?

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Why the atmosphere of the Sun is orders of magnitudes hotter than its surface is a long standing question in Solar Physics. Over the years, many studies have looked at the potential role of MHD waves in sustaining these high temperatures. In this study, we use 3D MHD simulations to investigate (driven) Alfvenic waves in a coronal loop. Due to the radial density profile, resonant absorption (or mode coupling) and phase mixing take part in the boundaries of the flux tube and the large velocity shears are subject to the Kelvin Helmholtz instability (KHI). The combination of these effects leads to enhanced energy dissipation and wave heating. By considering a variety of wave drivers and coronal loop profiles, we determine when this energy release is sufficient to balance radiative losses.

Student poster?

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