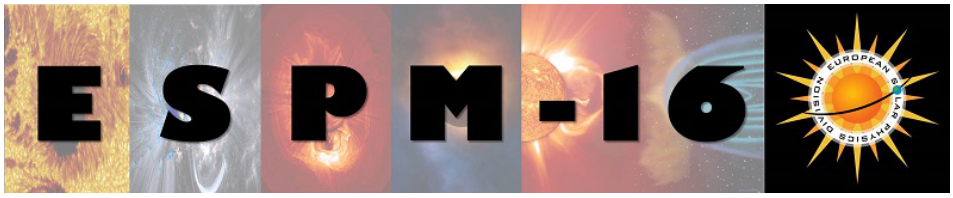

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Simulation of prominence oscillations triggered by a shock wave

Wednesday, 8 September 2021 10:05 (13 minutes)

Solar prominences are cold, dense structures nested in the hot and tenuous solar corona, made up of thread-like fibrils. Embedded in the magnetically dominated, dynamic corona, prominences also exhibit oscillatory behavior [1]. Understanding the interplay of mechanisms that cause prominence and thread oscillations provides important insight into the solar corona. Numerical simulations have been conducted [2, 3, 4] in order to analyze the exact mechanisms governing prominence behavior. To date, all studies on oscillations in prominences ignored their finer structure. The goal of this work is to study causal relations between a localized energy release and a remote prominence oscillation where the prominence has a realistic thread structure. In our setup, we notice coupled transverse and longitudinal oscillations. We use an adiabatic, 2D numerical model with an open-source MHD simulation code, MPI-AMRVAC [5]. We exploit the advantages of adaptive mesh refinement (AMR) to investigate how multiple threads react to a realistic source perturbation. The grid we employ consists effectively of 4160 × 800 cells, which allows us to resolve lengths of 36×7.5 km. This exceeds the resolution limits of observations.

Student poster?

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