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Is phase mixing important in the quiet Sun?

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The focus of many investigations on coronal wave heating has been on scrutinising the role of transverse (i.e. kink) modes; examining their damping by resonant absorption and the transfer of energy to Alfvén modes. Subsequently, the Alfvén modes are then subject to phase mixing and this leads to plasma heating. More recently, a non-linear mechanism for energy transfer has also been proposed, the so called uni-turbulence. Due to the ease with which they have been observed, the rapidly damped standing kink modes in active regions have spawned numerous studies investigating the role of resonant absorption in the observed damping. However, their counterparts in the quiet Sun, the propagating kink waves, have received little attention. Here I will discuss the results from a large-scale study of kink wave damping in the quiet Sun. We find convincing evidence that the damping of the kink waves is significantly weaker than in active regions and suggests that resonant absorption/phase mixing/uni-turbulence are not important for wave-based heating of the quiescent Sun. I will also discuss the physical reason we suspect is behind this result and what it tells us about the fine-scale structure of the quiescent corona.

Student poster?

Primary authors: MORTON, Richard (Northumbria University); Dr TIWARI, Ajay (Centrum Wiskunde & Informatica); Prof. MCLAUGHLIN, James (Northumbria University); Prof. VAN DOORSSELAERE, Tom (KU Leuven)

Presenter: MORTON, Richard (Northumbria University)

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