EUI High Resolution Observations of
Decayless Oscillations

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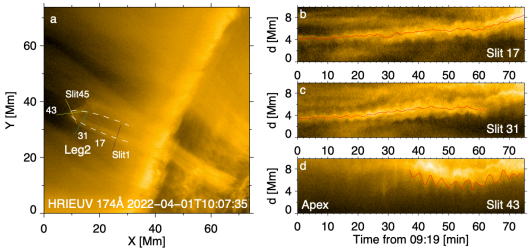
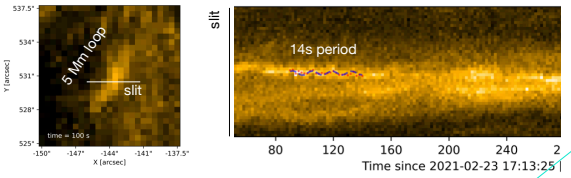


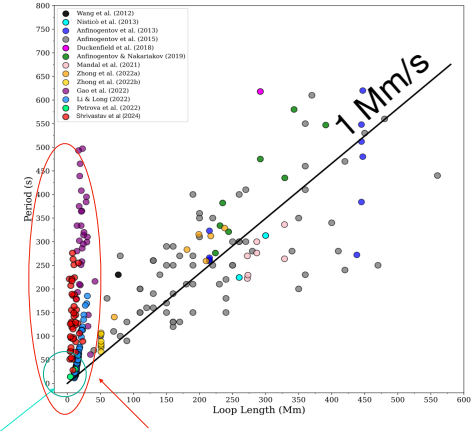
The HRIEUV telescope of EUI on Solar Orbiter
- 17.4 nm bandpass
- imaging cadence 2-10 sec
- spatial resolution (2 pix) 200 km (at perihelion)

Talk by Sihui Zhong Tuesday 14:15 "Polarization of decayless kink oscillations…"

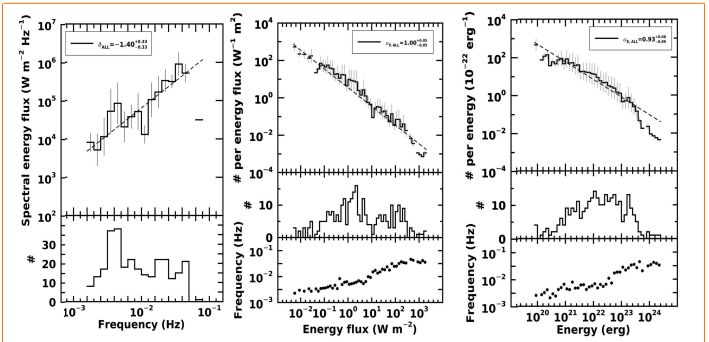
- Decayless oscillations are routinely observed with AIA and now also with HRIEUV. Co-observations EUI & AIA detect the same decayless oscillations, confirming that they are of solar origin.
- Decayless oscillations are different from flare-induced oscillations as they do not dampen during their lifetime and they are independent of flares. In fact the driver is unknown.
- These oscillations have been interpreted as kink-waves and the ratio between the loop length and the period tends to be in the order of 1 Mm/s, suggestive of the coronal Alfvén speed.



HRIEUV revealed the smallest decayless oscillations so far: loops of less than 5 Mm, oscillating with a period as fast as 14s.



Decayless oscillations in short loops have relatively long periods, with a ratio loop length/period of only ~100km/s.



Meta-analysis of 290 oscillations (AIA and EUI) by 10 authors. Higher energy fluxes are generated from higher-frequency oscillations. The total energy generated by transverse oscillations ranges from about 10^20 to 10^25 erg, (cfr energies for nanoflare 10^24 to 10^27 erg).The respective slope results imply that high-frequency oscillations could provide the dominant contribution to total coronal heating generated by decayless transverse oscillations.

To be explored:
- what drives decayless oscillations?
- why do we have two branches with different ratio loop length/period?
- are there enough decayless oscillations in different coronal zones for coronal heating?

Find out more:
- Zhong et al 2022MNRAS.516.5989Z
- Mandal et al 2022A&A...666L...2M
- Petrova et al 2023ApJ...946...36P
- Lim et al 2023ApJ...952L..15L
- Zhong et al 2023NatCo..14.5298Z
- Shrivastav et al 2024A&A upcoming

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