

Coronal seismology with two adjacent oscillating loops

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We present the SDO/AIA EUV observations of the transverse oscillations of coronal loops in the active region NOAA 1112 on 2011 Oct 16, 19:00 - 20:00 UT. Oscillations of a bundle of coronal loops, with the period of about 6 min, were observed to be triggered by an M2.9 flare at 19:07-19:12 UT. A detailed analysis of the most prominent loop in the bundle in 171 Å was recently published in reference ¹. In our analysis, we follow up that study, focussing on the multi-wavelength (131, 171, 193, 211, 335, 94 Å) information. Analysis of the behaviour of other loops in the bundle allowed us to measure the loop parameters and make coronal seismological diagnostics. We traced the loops manually and implement the automatic emission measure tools ^{2,3}. The parameters of the main loop were estimated as $\log(T_e)=5.91\pm 0.13$ K, $n_e=8.96\pm 0.14$ cm⁻³ $w=2.27\pm 0.47$ Mm; and of the fainter loop as $\log(T_e)=5.90\pm 0.13$ K, $n_e=8.95\pm 0.10$ cm⁻³ $w=1.93\pm 0.49$ Mm at about 19:20 UT, when it appears at maximum intensity.

Reference:

¹ Aschwanden, M.J. and Schrijver, C.J. 2011a, ApJ (submitted)

² Aschwanden, M.J. and Boerner, P. 2011b, ApJ, 732, 81

³ Aschwanden, M.J., Boerner, P., Schrijver, C.J., and Malanushenko, A. 2011c, Solar Physics (submitted)