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Growing transverse oscillations of a multistranded loop observed by SDO/AIA

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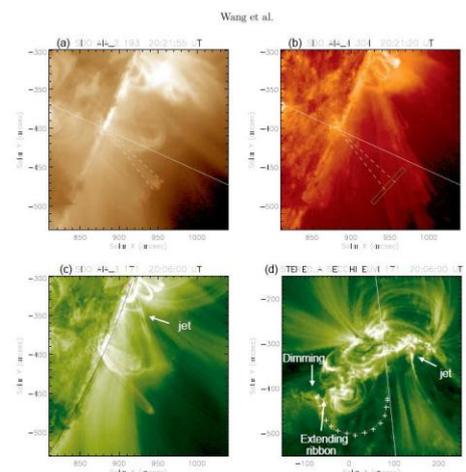


Dr. Tongjiang Wang is a Research Associate at Catholic University of America, working as a contractor at NASA’s Goddard Space Flight Center since 2007. He received his Ph.D. in Astrophysics from the NAOC in 1998. His research includes the dynamics, oscillations and flare activity in solar active region corona using EUV spectroscopic and imaging observations from various space missions. He has authored and coauthored 40 publications in solar physics in refereed journals.

He is at present the PI of a NASA grant. He served as a referee for leading journals in the field, and a reviewer for NASA proposals. He is a member of Solar Physics Division of American Astronomical Society, and a member of American Geophysical Union.

Abstract

The flare-excited transverse loop oscillations previously observed by TRACE have been mainly interpreted as the global fast kink modes. These oscillations typically show a rapid decay, and their damping mechanism has been a major topic of theoretical studies. In this presentation, we report an unusual case of transverse loop oscillations with growing amplitudes observed by SDO/AIA for the first time. This oscillation event was triggered by a flare associated with a CME above the limb. The multiwavelength analysis reveals that the loop consists of multithermal strands and their dynamical behaviors are temperature-dependent. These strands have very similar oscillation frequencies and appear to oscillate in-phase or in a quarter-period phase delay. These features suggest the coupling between kink oscillations of neighboring strands and the interpretation by the collective kink mode as predicted by some models. The transverse loop oscillations are also associated with intensity and loop width variations. We determine the trigger of the oscillation and measure the 3-D loop geometry using STEREO/EUVI-A data. The possible mechanisms that can excite the growing kink oscillations will be discussed.



All are welcome! Tea, coffee, biscuits will be served at 9:45 A.M.