

**The identification of MHD wave mode in the corona using
the Fourier spectra of intensity and Doppler velocity
obtained by EUV Imaging Spectrometer on board Hinode**

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Abstract. The Fourier analysis of the EUV intensity and Doppler velocity oscillations in the solar active region corona is presented. The behavior of oscillations gives us the clue to understand the properties of waves in the solar corona, which is crucial to study the coronal heating mechanism. From the middle of 1990s, various wave or oscillation events have been detected in the solar corona. We investigated the time series of Fe XII 195.12Å emission line intensity and Doppler velocity obtained by sit-and-stare observation with EUV Imaging Spectrometer on board Hinode. The Fourier spectra were calculated at all points along the EIS slit. The theory of MHD waves in coronal loops has shown that slow mode produces both intensity and Doppler velocity oscillations; fast sausage mode produces only intensity oscillation, whereas fast kink mode produces only Doppler velocity oscillation. Using the theory, we interpreted the spectra in terms of MHD waves and identified the mode of the detected oscillations. The slow acoustic mode and fast sausage mode waves were found in many coronal structures, while fast kink mode or torsional Alfvén mode waves were rarely seen. We also compared the existence of waves between at the footpoint of a hot loop (often called as “moss”) and at the apex of a cool loop, which resulted that there were slow mode and fast sausage mode waves at the former, while there were almost no signatures of waves at the latter.