TRANSVERSE OSCILLATIONS OF TWO CORONAL LOOPS

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Fast magnetohydrodynamic waves in a system of two coronal loops are studied. The system is modelled as smoothed, dense plasma cylinders in a uniform magnetic field. The collective properties of the complete system due the interaction between the individual loops are analysed from two points of view. Firstly, the normal modes of the equilibrium configuration are numerically calculated and the dependence of frequency with the separation between tubes and spatial distribution of the eigenfunctions is investigated. Secondly, we analyse the time dependent problem of the excitation of a pair of tubes. We find that there are four trapped normal modes that produce transverse oscillations of the loops. There are two modes where the loops oscillate in phase, while in the other two they oscillate in antiphase. The excitation of these modes depends of the shape and location of the initial disturbance. We find that the loop pair oscillates in the normal modes after an initial disturbance. In some cases, the system shows beating and the phase lag between the loops is $\pi/2$.