DECAY-LESS LOW-AMPLITUDE KINK OSCILLATIONS OF CORONAL LOOPS

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Kink oscillations of coronal loops, detected in the EUV band with the Imaging Assembly Array instrument of the Solar Dynamics Observatory are found to occur in two different regimes: the well-known rapidly decaying oscillations of large amplitude, and the newly-found decay-less and low-amplitude oscillations. In the latter regime the projected displacement amplitude is about 1 Mm. In both cases the periods of oscillations, ranging from 2 to 12 min, are different for different loops, and grow with the increase of the loop length. The oscillation phase, measured by the cross-correlation method, was found to be constant along each analysed loop. The spatial structure of the phase of the oscillations corresponds to the fundamental standing kink mode. We conclude that the observed behaviour is consistent with the empirical model in terms of a damped harmonic resonator affected by a non-resonant continuously-operating external force. The observed lifetime of the oscillations is likely to be determined by the observational conditions rather than any physical damping. However, the balance between the driving and damping is a necessary ingredient of this model.