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Numerical Simulations of the Kink oscillations in the solar coronal loops with field aligned flows

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The weakly-attenuated kink oscillations in the strand like structures of the solar coronal loops with field aligned flows have been observed by a number of observations through SOT/Hinode satellite e. g. , (Ofman & Wang 2008, A&A, 482, L9 and Antolin, P. & Verwichte, E. 2011, ApJ, 736, 121). Motivated with these observations, in this study we numerically examine the influence of such flows on the spatial and temporal signatures of impulsively generated standing fast magnetoacoustic kink waves in the strand like structures of the coronal loops, considering field aligned flows of uniform and inhomogeneous profiles. A full set of time dependent magnetohydrodynamics (MHD) equations is solved numerically taking into account the value of the flow of the order of observed flow detected by SOT/Hinode. We find that damping time of the standing kink waves decreases with increasing the half-width of the inhomogeneous flow and it eventually converges to the damping time corre sponding to uniform flow when half-width of the inhomogeneous flow attains a very large value. Further, a comparison between two different kinds of inhomogeneities corresponding to field aligned flow reveals that flow with transverse inhomogeneity plays more dominant role in damping than the flow with longitudinal inhomogeneity. The effects of the dense chromospheric-like layer at the foot points of the strand of a loop, i.e., the variation of the ratio of mass density of the chromosphere to ambient corona, as well as widths of the transition region are also examined on the characteristics of the kink waves.