The effect of the longitudinal density stratification on the standing kink modes for coronal loop oscillations

N Dadashi1, H Safari1, S Nasiri1,2
1. Physics Department, Zanjan University, Zanjan.
2. Physics Department, IASBS, Zanjan.

(Received 27 February 2008 : in final form 3 August 2009)

Abstract
We investigate the influence of longitudinal structuring on the fast kink modes of the coronal loops oscillations. Using a simple longitudinal exponential density structure, an analytical dispersion relation is derived. The properties of oscillatory periods and mode profiles and their deviations for such stratified structure are compared with those of the homogeneous tubes. Also, the effects of negative scale heights and total mass column on oscillation and mode profiles of the loops are investigated. Here we confirmed that the shift of the antinodes and mode profiles and the ratio of the frequencies are potentially good tools to estimate the density scale heights of the solar atmosphere.

Keywords: solar corona, magnetic fields, oscillations

For the full article refer to the Persian section