



FIG. 4: Time evolution of the inner tube obtained from Eq. (1) for three values of driven period: (a) 290 ps, (b) 320 ps, and (c) 500 ps. The data correspond for the same CNT oscillator and conditions of Fig. 2 (b). The oscillation frequency for the cases (a) and (b) are 3.4 and 1.6 GHz, respectively.

achieved by the use of additional CNT junctions along the outer tube) can prevent such vibrations and increase the stability of the nanodevice proposed here.

In summary, based on numerical calculations and molecular dynamics simulations we demonstrated that the use of thermal gradients can be an effective approach to initialize, control, and tune CNT-based oscillators. Financial support from the Brazilian agencies FAPESP (grant 2007/03923-1) and CNPq is acknowledged.

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