A molecular dynamics study on fullerene-implanted carbon nanotori as electromagnetic sensing and emitting devices

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Abstract

Open-ended carbon nanotubes have been found to form toroidal structures [1]. These specific structures bear striking resemblance to electrographic coils. Two modes of action can be thought of: Either the metallic conductivity of certain chiralities of the nanotorus configuration is exploited directly or fullerenes may be implanted into the torus' inner region [4]. Alone these fullerenes are charge-neutral, but they may easily be inoculated with metalls carrying additional charges. Henceforth, currents would not act upon the electrons in the nanotorus' surface but also on the fullerene's surplus charges. This interplay may lead to very interesting applications. We have investigated the mechanical stability of these toroidal systems by molecular dynamics simulation [3], employing a potential by [2], well-suited for carbon. This research has significant importance on the frequency and quality for applications employing nanotori as tunable circuits. We report on the current status of our findings.

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