

## عنوان مقاله:

Electronic band structure of a Carbon nanotube superlattice

## محل انتشار:

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## خلاصه مقاله:

By employing the theoretical method based on tight-binding, we study electronic band structure of single-wall carbon nanotube (CNT) superlattices, which the system is the made of the junction between the zigzag and armchair carbon nanotubes. Exactly at the place of connection, it is appeared the pentagon–heptagon pairs as topological defect in carbon hexagonal network. The calculations are based on the tight binding model in the nearest-neighbor approximation. We seek to describe electronic band structure in the presence of the pentagon-heptagon pairs. Our calculation show that the pentagon–heptagon pairs defect in the nanotube structures is not only responsible for a change in a nanotube diameter, but also governs the electronic behaviour around Fermi level. Also, we obtain the Fermi energy of the system via integration of the density of states and matching it to the number of electron .in the unit cell. The numerical results may be useful to design of electronic devices based on CNTs

## کلمات کلیدی:

Carbon Nanotube, Tight–binding model, Pentagon-heptagon pair defect, Band Structure, SW defect

## لینک ثابت مقاله در پایگاه سیویلیکا:

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