

Analytical Calculations of Normal Vibration Forms and Their Dispersion with Using of Projective Representations of Symmetry Groups for Carbon Nanotubes

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The forms of normal vibrations of achiral (zigzag and armchair) singlewall carbon nanotubes (SWNT) were built using projective operator technique.

For the calculations of the normal vibration modes with $k \neq 0$ and their dispersion the projective operator method applied to the matrices of projective representations of spatial wave vector groups was used. It was found that dispersion curves of normal vibrations at the edges of Brillouin zones of SWNTs stick together in pairs.

The chiral splitting of the vibrational modes is discussed.