Abstract Submitted
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Energy level curvatures, parametric motion of electron spectra in carbon nanotubes[1] ISA ZHAREKESHEV — We examine scaling properties of statistical spectral measures of single-walled nanotubes in the frame of a standard tight-binding model for modified quasi one-dimensional disordered systems. Numerical-scaling analysis is performed for the energy correlation function, the spectral factor and the distributions of the level curvatures and velocities. Non-analyticity at the zero velocities and curvatures is found, which can be lifted by applying a moderate magnetic field. In the limit of weak disorder and at B=0 the level curvature distribution does not entirely obey Wigner-Dyson statistics, but is rather a non-trivial combination of the GOEs distributions depending of the aspect ration of the modelled nanotube. At strong disorder the curvature distribution deviates from the conventional log-normal statistics. The results are verified on the double-wall carbon nanotubes. Similar applications for graphene structures are considered.

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Isa Zharekeshev
Rechenzentrum Erlangen, Eurasian National University

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