SUPERSYMMETRIC TWISTING OF CARBON NANOTUBES

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We construct exactly solvable models of twisted carbon nanotubes via supersymmetry, by applying the matrix Darboux transformation. We derive the Green's function for these systems and compute the local density of states. Explicit examples of twisted carbon nanotubes are produced, where the back-scattering is suppressed and bound states are present. We find that the local density of states decreases in the regions where the bound states are localized. Dependence of bound-state energies on the asymptotic twist of the nanotubes is determined.