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**Quantum electron transport in toroidal carbon nanotubes** MARK JACK, MARIO ENCINOSA, Florida A&M University, Physics Department, Tallahassee, FL 32307. — Electron transport under bias is treated in tight-binding approximation using a non-equilibrium Green's function approach. Density-of-states D(E), transmissivity T(E), and current $I_{SD}$ are calculated through a (3,3) armchair nanotorus with laterally attached metallic leads and a magnetic field penetrating the toroidal plane. Plateaus in T(E) through the torus are observed as a function of both the relative angle between leads and magnetic flux. Initial computational studies performed with 1800 atoms and attached leads show substantial computational slowdown when increasing the system size by a factor of two. Results are generated by inverting the device Hamiltonian with a standard recursion method extended to account for unit cell toroidal closure. Significant computational speedup is expected for a parallelized code on a multiprocessor computer cluster. The dependence of electronic features on torus size and torus curvature is tested for three tori with 900, 1800 and 3600 carbon atoms, respectively. References: 1. M. Jack and M. Encinosa, Quantum electron transport in toroidal carbon nanotubes with metallic leads. ArXiv: quant-ph/0709.0760. 2. M. Encinosa and M. Jack, Dipole and solenoidal magnetic moments of electronic surface currents on toroidal nanostructures. J. Comp.-Aided Mat. Design (Springer), 14 (1) (2007) 65 – 71.

Mark Jack
Florida A&M University, Physics Department, Tallahassee, FL 32307.

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