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Transport properties of C60/nanotube heterostructures WU SHI, Lawrence Berkeley National Laboratory; Univ of California, Berkeley, THANG PHAM, HAMID BARZEGAR, Univ of California, Berkeley, ALEX ZETTL, Lawrence Berkeley National Laboratory; Univ of California, Berkeley — Crystal structures determine the electronic properties. The fullerene C60 is insulating but can become superconducting with Tc above 30 K by inserting atoms or apply a pressure. In addition, Tc changes with the distance between fullerene molecules. Because of relatively weak intermolecular interactions, C60 molecules can even pack into nanowire structures with low dimensional constrains imposed by carbon nanotubes (CNTs) or boron nitride nanotubes (BNNTs). In this study, we will report the characterization of C60/nanotube heterostructures and their transport properties. By filling into nanotubes, C60 molecules form one-dimensional quasi-crystal structures, which are absent in bulk or film forms. The C60-C60 intermolecular distance changes with the tube diameters, which could potentially yield rich transport properties.

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