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Electron transport in single-walled carbon nanotube coupled to superconducting leads YONG ZHANG, GANG LIU, JEANIE LAU, Univ of California Riverside — We investigate electron transport through individual single-walled carbon nanotubes(SWCNT). The transport characteristic changes dramatically when the metal electrodes of the devices switch from normal state into superconducting state. In such a situation, CNT functions as a weak link in between the superconductors(S),constituting a Josephson junction. If the contact is highly transparent, individual SWCNT can carry a supercurrent by means of proximity effect. We performed the transport measurement through S-CNT-S type Josephson junction at 260mK. Only those nanotube devices with room temperature resistance below 15kOhm were examined. The differential conductance of S-CNT-S junction showed periodic oscillations as a function of both drain-source and gate voltage, a signature of Fabry-Perot interference. Moreover, we observed a pronounced zero-bias conductance peak, which is tunable by gate voltage. Such conductance peak is attributed to multiple Andreev reflections at the S-CNT interfaces. Further experimental results in different magnetic fields and temperature will be discussed.

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