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Thermal Emission of Suspended Carbon Nanotube ZUWEI LIU, ADAM BUSHMAKER, MEHMET AYKOL, STEVE CRONIN, USC TOPRAMAN TEAM — We study the thermal emission spectra of individual suspended carbon nanotube induced by electrical heating. Semiconducting and metallic devices exhibit different spectra, based on their distinctive bandstructures. These spectra are compared with the ideal blackbody emission spectrum. In the response region of our detector, i.e. visible to near infrared, the thermal emission spectra of semiconducting devices agree well with Planck's law, while the spectra of metallic devices show an additional peak around 1.65 eV. For semiconducting devices, the temperature of the nanotube was fitted to Planck's law, and was compared with the temperature fitted from the G band downshift as well as the Stokes:anti-Stokes intensity ratio. For devices showing thermal non-equilibrium, the electron temperature agrees well with G+ downshift, but deviates from G- downshift. Finally, for metallic devices, partially polarized IR emission was observed, and possible mechanisms are discussed.

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