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标题: Terahertz detection mechanism and contact capacitance of individual metallic single-walled carbon nanotubes

作者: Chudow, JD (Chudow, Joel D.); Santavicca, DF (Santavicca, Daniel F.); McKitterick, CB (McKitterick, Chris B.); Prober, DE (Prober, Daniel E.); Kim, P (Kim, Philip)

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摘要: We characterize the terahertz detection mechanism in antenna-coupled metallic single-walled carbon nanotubes. At low temperature, 4.2 K, a peak in the low-frequency differential resistance is observed at zero bias current due to non-Ohmic contacts. This electrical contact nonlinearity gives rise to the measured terahertz response. By modeling each nanotube contact as a nonlinear resistor in parallel with a capacitor, we determine an upper bound for the value of the contact capacitance that is smaller than previous experimental estimates. The small magnitude of this contact capacitance has favorable implications for the use of carbon nanotubes in high-frequency device applications. (C) 2012 American Institute of Physics. [<http://dx.doi.org/10.1063/1.4704152>]

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地址: [Chudow, Joel D.; Santavicca, Daniel F.; Prober, Daniel E.] Yale Univ, Dept Appl Phys, New Haven, CT 06511 USA

[McKitterick, Chris B.; Prober, Daniel E.] Yale Univ, Dept Phys, New Haven, CT 06511 USA

[Kim, Philip] Columbia Univ, Dept Phys, New York, NY 10027 USA

通讯作者地址: Chudow, JD (通讯作者), Yale Univ, Dept Appl Phys, New Haven, CT 06511 USA

电子邮件地址: daniel.prober@yale.edu

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