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An Essential Mechanism of Heat Dissipation in Nanocarbon Electronics[1] SLAVA V. ROTKIN, Lehigh University, ALEXEY G. PETROV, Ioffe Institute — Nanocarbon materials were proposed and have been already used for fabricating electronic devices. These nanocarbon devices are not unlike other semiconductor devices and are subject to Joule losses. However the physics of heat dissipation in those materials is unlike the classical thermal physics. This talk focuses on near-field radiative heat dissipation mechanism in nanocarbon materials, the associated component of the heat transport across the interface with the substrate and remote Joule losses. Analytical theory was derived which allows one to trace the origin of anomalously large strength of the effect and predict dependence on the materials parameters. It was predicted to be very substantial and for certain surface morphology dominate over other mechanisms, as it was recently shown experimentally.

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