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Room-Temperature Voltage Rectification in Graphite YAKOV KOPELEVICH, Hewlett-Packard Laboratories, 1501 Page Mill Road, Palo Alto, California 94304, USA, J.C. MEDINA PANTOJA, ROBSON R. DA SILVA, Instituto de Física “Gleb Wataghin,” Universidade Estadual de Campinas, UNICAMP 13083-970, Campinas, São Paulo, Brasil, ALEX M. BRATKOVSKY, Hewlett-Packard Laboratories, 1501 Page Mill Road, Palo Alto, California 94304, USA — Four-probe current-voltage (I-V) characteristics were measured on 80-250 nm thick graphite samples, obtained by cleaving and placed on Si substrate, in the temperature interval $2\text{ K} \leq T \leq 300\text{ K}$ and applied magnetic field up to 9 T. Nonlinear and/or hysteretic I-V curves with a pronounced asymmetry with respect to the current polarity were obtained even at $T = 300\text{ K}$. We demonstrate that voltage rectification and related effects in graphite resemble very much that known for inhomogeneous superconducting systems [1], suggesting the occurrence of superconducting correlations in graphite at room temperature. We also discuss the role of the ferromagnetic ordering at graphitic edges in the observed phenomena.

[1] G. Carapella and G. Costabile, Phys. Rev. Lett. 87, 077002 (2001).

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