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Optical studies of multilayer graphene in magnetic fields[1]
HSIANG-LIN LIU, Department of Physics, National Taiwan Normal University, G. L. CARR, Brookhaven National Laboratory, National Synchrontron Light Source, K. A. WORSLEY, M. E. ITKIS, E. BEKYAROVA, R. C. HADDON, Department of Chemistry, University of California-Riverside, A. N. CARUSO, Center for Nanoscale Science and Engineering, North Dakota State University — We report the optical properties of multilayer graphene thin films grown on silicon substrate. The room-temperature reflectance and transmittance of the samples were measured over the energy range from the far-infrared to near-infrared. To extract the optical constants of the films, we analyzed all of the layers of this thin-film structure using a Drude-Lorentz model. From the parameters obtained, we compute the optical constants. With decreasing temperature, the far-infrared transmittance of the samples is increasing up to 4 % down to 2 K. Interestingly, in an applied magnetic field of up to 10 Tesla, the giant positive magneto-optical effects over 20 % are observed in the far-infrared region from 2 K to 300 K. Possible origin of these will be discussed.

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