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Giant mid-infrared Kerr enhancement from films on SiC[1] ALOK MUKHERJEE, M. MURAT ARIK, State Univ of NY - Buffalo, CHASE T. ELLIS, Electronics Science & Technology Division Code 6800, U.S. Naval Research Laboratory, Washington, DC, USA,, PAYAM TAHERI, ANDREAS V. STIER, MYOUNG HWAN KIM, HAO ZENG, JOHN CERNE, State Univ of NY - Buffalo, JOSEPH G. TISCHLER, EVAN R. GLASER, RACHEL L. MYERS WARD, JOSEPH L. TEDSCO, CHARLES R. EDDY JR, D. KURT GASKILL, Electronics Science & Technology Division Code 6800, U.S. Naval Research Laboratory, Washington, DC, USA,, YU LIU, SHUNCHONG WANG, GANG WANG, Institute of Physics, Chinese Academy of Sciences, China — We report an enhancement of over an order of magnitude in the complex Kerr angle at photon energies near 121 meV in a variety of films on SiC substrates. The change in the reflected polarization in the presence of an out-of-plane magnetic field (polar magneto-optical Kerr effect, PMOKE) is measured in films ranging from graphene on SiC, aluminum doped SiC and iron oxide deposition on SiC. We model the PMOKE signal using multilayer analysis and find that the main contributor to this enhancement is the index of SiC becoming unity near 121 meV, at the edge of the Reststrahlen band of SiC. This result not only increases our sensitivity to PMOKE in a wide range of materials but also suggests that choice of substrate plays an important role in enhancing Kerr signal. This work is supported by NSF-DMR1006078.

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Alok Mukherjee
State Univ of NY - Buffalo

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