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Insight into Topological Insulators from Infrared Spectroscopy N. STOJILOVIC, University of Wisconsin Oshkosh, S.V. DORDEVIC, G.M. FOS-TER, M.S. WOLF, The University of Akron, H. LEI, C. PETROVIC, Brookhaven National Laboratory, Z. CHEN, Z.Q. LI, National High Magnetic Field Laboratory, M.V. NIKOLIC, Institute for Multidisciplinary Research, University of Belgrade, S.S. VUJATOVIC, Z.Z. DJURIC, P.M. NIKOLIC, Serbian Academy of Sciences and Arts — Topological insulators are certain band-insulator compounds that exhibit a new phase of quantum matter with inverted insolating energy gap. As a result, these bulk insulators have conducting states on the surface. This new state of matter is a consequence of strong spin-orbit coupling in these materials. We use infrared reflectance spectroscopy to probe electrodynamics of charge carriers at different temperatures and we conduct magneto-optical spectroscopy experiments to probe magneto-electric coupling. We present findings on several second-generation Bi-based topological insulators at temperatures ranging from 10 to 300 K and in magnetic fields up to 18 T. In addition, we discuss the charge inhomogeneities in these novel materials.

Nenad Stojilovic University of Wisconsin Oshkosh

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