

Abstract Submitted
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Observation of long carrier lifetime in photoexcited Sb-doped Bi_2Se_3 nanoplates¹ ADAM GROSS, YASEN HOU, ANTONIO ROSSI, DONG YU, INNA VISHIK, University of California, Davis — Bi_2Se_3 is a three-dimensional topological insulator (TI), characterized by a bulk band gap of approximately 0.3 eV and a Dirac-like protected surface state. The material is usually n-type due to selenium vacancies, and chemical substitution, such as Sb-doping, is typically needed to bring the chemical potential into the bulk band gap. We will present ultrafast transient reflectivity measurements on Bi_2Se_3 and $(\text{Bi,Sb})_2\text{Se}_3$ nanoplates which reveal starkly different carrier dynamics in n-type vs. insulating samples. This will be discussed in the context of optoelectronic applications of TIs, including as a material for exciton condensation.

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