Brillouin Light Scattering Studies of Topological Insulators Bi2Se3, Sb2Te3, and Bi2Te3

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ABSTRACT: Brillouin Light Scattering has been used to examine acoustic waves in three different Topological Insulators: Bismuth Selenide Bi2Se3, Antimony Telluride Sb2Te3, and Bismuth Telluride Bi2Te3. Two samples of each material were studied to ensure the accuracy of the results obtained. In general, surface mode, quasi-transverse, and quasi-longitudinal bulk modes were observed in all these materials. Rayleigh surface phonon velocities were obtained for the first time from the corresponding Brillouin peak frequency shifts. Quasi-transverse and quasi-longitudinal bulk mode velocities were also obtained. Elastic constants C33 and C44 were calculated from the measured bulk-velocities. Both bulk acoustic phonon velocities and elastic constants were compared to those obtained in previous studies. All results obtained have been found to be in good agreement with both experimental and some theoretical available studies.

ALL ARE WELCOME!!!