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Structural and optical properties of Bismuth Selenide (Bi_2Se_3) thin films: Thickness and substrate dependence[1] YUB RAJ SAPKOTA, ASMA ALKABSH, AARON WALBER, SARAH KOVAC, HASSANA SAMASSEKOU, DIPANJAN MAZUMDAR, SIUC — Bi_2Se_3 is a topological insulator that has gained much attention in both theoretical and experimental condensed matter due to its inherently fascinating structural property of acting like a metal on the surface and an insulator in the bulk form. Here we report on structural and optical properties of Bismuth Selenide thin films of various thickness (10 QL to 90 QL), and grown on different substrates by means of magnetron sputtering. Structural and interface properties are characterized by means of high-resolution X-ray diffraction and reflectivity. Spectroscopic ellipsometry and Reflectance/UVVIS spectroscopy is used to understand their optical properties. Our results indicate a successful growth of few layer Bi_2Se_3 on all substrates with Al_2O_3 distinguishing itself by its atomically smooth feature. Variation of electronic properties with thickness and substrate will be discussed.

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