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**Experimental determination of the valence band of $Bi_2Se_3$**[1] YI-BIN GAO, BIN HE, Department of Mechanical and Aerospace Engineering, Ohio State University, IOANNIS ANDROULAKIS, Gentherm Inc., 1321 Mountain View Circle, Azusa, CA 91702, JOSEPH P. HEREMANS, Department of Mechanical and Aerospace Engineering, Department of Physics. Ohio State University — P-type $Bi_2Se_3$ is predicted theoretically to have good thermoelectric properties[1], because its valence band has a high calculated density of states (DOS). In this presentation, p-type $Bi_2Se_3$ samples are prepared both as single crystals and as polycrystals. Shubnikov - de Haas (SdH) measurements are carried out in a rotating stage on single crystals to obtain the Fermi surface cross-sections and the cyclotron effective masses. Thermoelectric transport measurements are done on polycrystals, and used to construct Pisarenko plots of Seebeck coefficient versus hole concentration. The Fermi surface cross-section measurements confirm the theoretically predicted [1] shape of the Fermi surface.Both cyclotron masses and Pisarenko plotsare in good agreement and show that p-type $Bi_2Se_3$ has a hole effective mass smaller than the theoretically predicted value. The reason for the discrepancy is not yet understood at this time. Reference: [1] Phys. Rev. X 1, 021005 (2011)

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