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Terahertz conductivity study of predicted Weyl semimetal $Nd_2Ir_2O_7$ and $Eu_2Ir_2O_7$ thin films[1] MATTHEW T. WARREN, J.C. GALLAGHER, T.T. MAI, J. BRANGHAM, F. YANG, Center for Emergent Materials, Department of Physics. The Ohio State University. Columbus, OH 43210, C.M. MORRIS, N.P. ARMITAGE, Department of Physics & Astronomy, The Johns Hopkins University, R. VALDÉS AGUILAR, Center for Emergent Materials, Department of Physics. The Ohio State University. Columbus, OH 43210 — There is currently a growing interest in identifying materials with novel topological properties outside of the s- or p-orbital based bismuth chalcogenide topological insulators. One such proposal is the pyrochlore iridate materials $R_2Ir_2O_7$, where R is a lanthanide series atom or yttrium. These have been predicted to be Weyl semimetals, containing exotic Fermi arc surface states and also an anomalous Hall effect. We have studied the temperature dependent terahertz conductivity of thin films of $Nd_2Ir_2O_7$ and $Eu_2Ir_2O_7$ grown by a novel off-axis sputtering technique. We find a close correspondence between DC transport properties and the extracted Drude parameters from fits to the THz conductivity. We will discuss these results in light of the predicted Weyl semimetal state of these materials.

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