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Synthesis and Field Skin Depth Studies on Tin Doped $CeIn_3$[1]
KRISTEN COLLAR, Florida State University, JASON COOLEY, Los Alamos National Lab, STAN TOZER, FSU-National High Magnetic Field Laboratory — $CeIn_3$ is a cubic antiferromagnetic heavy fermion metal that orders with a Néel temperature of 10.1K at zero magnetic field. It requires fields up to 64T in order to see the Néel transition, however, low doping of tin has been shown to greatly reduce the Néel temperature into more accessible fields. The partial replacement of trivalent indium by tetravalent tin increases the number of conduction electrons and the nearly spherical Fermi surface occupies a larger fraction of the Brillouin zone. Small dopings will be critical in order to make the Néel transition more accessible given the magnets available at the National High Magnetic Field Laboratory (NHFML). The crystals will be characterized by calculating the Residual Resistance Ratios (RRR) using the resistivity option on the Physical Property Measurement System (PPMS) to determine the quality of the crystals. Skin depth measurements of the samples will be conducted by employing a Tunnel Diode Oscillator (TDO). The oscillations observed using the TDO will yield information about the Fermi surface and hopefully reveal information about the anomaly transition observed in the H-P phase diagram of $CeIn_3$ at t $\sim$400mK.

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