Abstract Submitted
for the NWS19 Meeting of
The American Physical Society

Phase diagram and quantum oscillations of RAgSb2 R=(La, Gd)

ANNA ROCHE, SHUA SANCHEZ, JIUN-HAW CHU, University of Washington —

Previous research suggests an association between high-temperature superconductivity and a quantum critical point arising from suppression of the magnetic and/or structural phase transitions via chemical doping. Here, we explore a chemical doping sequence of $LaAgSb_2$ and $GdAgSb_2$ to study a similar phase competition found in many copper-based and iron-based high-temperature superconductors. Systematic measurements of the resistivity, susceptibility, and quantum oscillations are presented for single-crystal samples of the chemically substituted $RAgSb_2$ (R=Gd,La). Doping the parent compound $LaAgSb_2$ with Gd explores the effect of magnetic doping and applying chemical pressure to the crystal. $La_{1-x}Gd_xAgSb_2$ exhibits charge density ordering around that is suppressed with increase Gd percentages, while $Gd_{1-x}Y_xAgSb_2$ exhibits anti-ferromagnetic ordering that is suppressed with increasing Y percentages. Resistivity and susceptibility data are used to identify phase transition temperatures and create a temperature vs doping phase diagram for each chemical substitution family. These diagrams show a strong suppression of charge density waves with magnetic gadolinium doping and the appearance of an antiferromagnetic state, with no apparent coexistence of charge and magnetic ordering. Additionally, magnetic quantum oscillation data are presented showing the changes in the Fermi surface and effective mass with chemical doping.

Anna Roche
University of Washington

Date submitted: 11 Apr 2019 Electronic form version 1.4