Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Ultrasensitive detection of superconducting transitions within doped Sr_2IrO_4[1] JAMES WAMPLER, JUAN TRASTOY, Univ of California - San Diego, GANG CAO, University of Colorado at Boulder, IVAN SCHULLER, Univ of California - San Diego — Previous studies have shown that the electronic structure of electron-doped Sr_2IrO_4 highly resembles that of hole-doped cuprates. This fact and the similarity of their crystal structures make doped Sr_2IrO_4 a promising candidate for high-temperature superconductivity. [1] We doped polycrystalline Sr_2IrO_4 in both Sr and Ir sites using powder metallurgy and characterized them with X-ray diffraction (XRD) and vibrating sample magnetometry (VSM). By mixing powders, it is possible to synthesize interesting off-stoichiometry minority phases, which XRD and VSM sometimes cannot detect. However, these phases may still be superconducting. In order to search for superconductivity in the bulk and minority phases, we used magnetic field modulated microwave spectroscopy (MFMMS). MFMMS has been shown to be an ultrasensitive technique, able to detect superconducting volumes as small as 10^{-12} cc. In some samples, we found strong MFMMS evidence for a superconducting transition that was beyond the sensitivity limit of either VSM and XRD. We will discuss the possible implications of these results. 1. T. F. Qi, G. Cao, et al., J. Appl. Phys., **109** 07D906 (2011)

[1]Work at UCSD supported by AFOSR grant FA9550-14-1-0202, J.T. acknowledges support from Fundacin Areces (Spain)

James Wampler
Univ of California - San Diego

Date submitted: 10 Nov 2016 Electronic form version 1.4