Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Angle and frequency dependent low field microwave absorption in electronically doped Ca 122 pnictides: Comparison of high Tc = 42 K phase in Pr, Nd, Ce and La doping AUSTIN HOWARD, JONATHAN YUEN, MYRON SALAMON, ANVAR ZAKHIDOV, The University of Texas at Dallas, BING LV, PAUL C. W. CHU, Texas Center for Superconductivity, University of Houston, DANIEL SELLS, National EPR Research Service, University of Manchester — The motivation of this study is to investigate the properties of a unique interfacial superconducting phase in electron-doped Ca 122 pnictides by the Low Field Microwave Absorption (LFMA) technique. Samples are exposed to microwave radiation with frequency ν_{MW} between 1 and 24 GHz, and also to a low strength magnetic field which modulates at $\nu_{mag} = 100$ kHz. Due to their single crystalline nature, the pnictides can be oriented relative to the MW polarization and magnetic field direction. Studying this orientation dependence reveals filament-like micro-interfaces between highly doped regions and poorly doped regions. These interfaces may be responsible for a high $T_c \sim 42$ K superconducting phase. We demonstrate that this higher T_c can be clearly distinguished from the low temperature bulk SC phase by the angle-dependent LFMA method. Additionally, variation of the MW frequency yields changes in the spectra which are in agreement with theoretical predictions.

Austin Howard
The University of Texas at Dallas

Date submitted: 09 Nov 2012 Electronic form version 1.4