Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Tuning superconductivity in $Nb_2Pd_{0.81}S_5$ using applied pressure and uniaxial strain KUAN-WEN CHEN, QIU RUN ZHANG, NHMFL, Florida State Univ., DANIEL JACKSON, Univ. Florida, ANDREW GALLAGHER, NAOKI KIKUGAWA, SCOTT RIGGS, DAVID GRAF, NHMFL, Florida State Univ., JAMES HAMLIN, Univ. Florida, LUIS BALICAS, RYAN BAUMBACH, NHMFL, Florida State Univ. — $Nb_2Pd_{0.81}S_5$ is a recently reported transition metal-chalcogenide superconductor ($T_c \sim 6.6$ K) with unusually large upper critical fields (H_c >37 T for H // b) [1]. We present electrical resistivity measurements under applied pressure for this compound, where a piston cylinder cell was used with Daphne 7474 oil as the pressure transmitting medium. These measurements reveal that the superconducting transition temperature abruptly increases to 8.5 K for P <2 kbar, but additional pressure (up to 16 kbar) has little effect on T_c. This result may indicate that while the electronic state of this compound is sensitive to strain, it is only weakly affected by hydrostatic pressure. This viewpoint is supported by subsequent experiments where application of Daphne oil or N-grease to the crystal surface results in an increase of T_c to 8 K. In order to systematically disentangle the influence of pressure and strain, we will present results from resistivity measurements where the sample is uniaxially strained using a piezo-stack ("elastoresistance") along the b direction.

[1] Q.Zhang, et. Al.,"Superconductivity with extremely large upper critical fields in $Nb_2Pd_{0.81}S_5$," Scientific Reports(2013).

Kuan-Wen Chen
NHMFL, Florida State Univ.

Date submitted: 13 Nov 2014 Electronic form version 1.4