Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Signature of Cooper pairs in the Metallic and Insulating Phases of Homogeneously Disordered Superconducting Ta Films[1] YIZE STEPHANIE LI, California State University, Bakersfield — With the increase of magnetic field or the decrease of sample thickness, homogeneously disordered superconducting Ta films undergo a superconductor-metal-insulator phase transition [1][2]. Each phase displays remarkably different nonlinear current-voltage (I-V) characteristics. The evolution of the nonlinear transport in the insulating phase exhibits a non-monotonic behavior as the magnetic field is increased, which could be evidence of the presence of localized Cooper pairs in the insulating phase [3]. As the metallic phase intervenes the superconducting and insulating states in Ta films, we further suggest that Cooper pairs also exist in the metallic ground state. References: [1] Y. Qin et al., Phys. Rev. B 73, 100505(R) (2006). [2] Y. Li et al., Phys. Rev. B 81, 020505 (R) (2010). [3] Y. S. Li, Supercond. Sci. Technol. 28, 025002 (2015).

[1]Data acquisition for this work was completed at the University of Virginia.

Yize Stephanie Li
California State University, Bakersfield

Date submitted: 05 Nov 2015 Electronic form version 1.4