Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Low Field Microwave Absorption in thin films of FeSe and FeTeSe deposited by PLD JONATHAN YUEN, AUSTIN HOWARD, Nanotech Institute, University of Texas at Dallas, LI CHEN, HAIYAN WANG, Electrical & Computer Engineering, Texas A&M University, MYRON SALAMON, ANVAR ZAKHIDOV, Nanotech Institute, University of Texas at Dallas — Our motivation is to study the 2D superconductivity of Fe-based materials deposited on different substrates - glass, STO and CNT. Pulsed laser deposition of FeSe and FeSe0.5Te0.5 films was performed. Deposition conditions including laser fluences, frequency, temperature and back pressure were optimized for different substrates. When anisotropic superconductors are confined to lower dimensions, interesting effects have been observed. Enhanced superconductivity might occur from interfacial effects, and it has been claimed that an atomic layer of FeSe may exhibit higher Tc at STO interface. LFMA (microwave absorption at low magnetic fields) is a highly sensitive tool for searching for possible higher Tc phases in FeSe based films, especially when combined with ESR, SQUID magnetometry and resistivity measurements. LFMA uses an external magnetic field to create Josephson Junction vortices, which are non-resonantly excited by MW radiation. Such vortices have strong angle dependence in 2D systems and can be used to carefully probe and understand confinement effects. The LFMA spectrum exhibits two distinct features in different temperatures: a hysteretic LFMA below 8K and non-hysteretic narrow LFMA at higher T. Angle dependences of the LFMA signals are analyzed and the origin of the higher Tc LFMA signals will be discussed.

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Date submitted: 20 Nov 2012 Electronic form version 1.4