Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Resistivity, Hall coefficient, and magnetoreistance of superconducting $FeSe_{1-x}Te_x$ thin films** HSIEN-HUNG CHANG, JIU-YONG LUO, CHUN-TE WU, FONG-CHI HSU, TA-KUN CHEN, MAU-KUEN WU, MING-JYE WANG, Academia Sinica — We report the normal state transport properties of superconducting $FeSe_{1-x}Te_x$ films, for 0<x<0.9. The thin films were grown on MgO substrate by pulsed laser deposition (PLD) technique. All of films exhibit tetragonal structure with c-axis preferred orientation. The superconducting transition temperature of $FeSe_{1-x}Te_x$ films depends on Te substitution level and the normal state resistivity changes from metal-like to semiconductor-like behavior gradually as Te substitution level is increased. The strong temperature and Te substitution level dependences of Hall coefficients demonstrate the multi-band characteristic and the modification of Fermi surface by Te substituted. The magnetoresistance of films with low Te substitution is positive and shows a regular quadratic dependence on magnetic field. For higher Te substitution, the magnetoresistance changes from positive to negative and that can be attributed to the weak localization effect. The magnitude of Hall coefficient and magnetoresistance changes quickly below the temperature of structural distortion. Our results strongly demonstrate the importance of low temperature structural distortion on the scattering rate of carriers.

Hsien-Hung Chang
Academia Sinica

Date submitted: 18 Nov 2009 Electronic form version 1.4