Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Quasi 2D correlated metals: Unusual transport properties in strained heteroepitaxial ultrathin films[1] E.J. MOON, B.A. GRAY, J. LIU, M. KAREEV, Phys. Dep., Univ. of Arkansas, Fayetteville, B. DABROWSKI, Phys. Dep., Northern Illinois Univ., J.W. FREELAND, APS, Argonne National Lab., I-C. TUNG, M.J. BEDZYK, Mat. Sci. Eng., Northwestern Univ., L.H. TJENG, Max Planck Inst. for Chem. Phys. of Solids, Germany, S.G. ALTENDORF, F. STRIGARI, Physikalisches Inst., Univ. zu Köln, Germany, V.P. KUNETS, G.J. SALAMO, J. CHAKHALIAN, Phys. Dep., Univ. of Arkansas, Fayetteville — We explore the electrical transport and magnetoconductance in quasi 2D strongly correlated heteroepitaxial films of $LaNiO_3$ to investigate the effect of quantum confinement and strain on electron-electron and electron-lattice interactions over the whole temperature range (2-300K) including the effect of metal-insulator transition. The quantum corrections to the conductivity indicate that the combination of the weak localization and the electron-electron interaction in the quasi 2D limit gives rise to unusual T-dependent resistivity. Ultrathin films spanning tensile strain up to $\sim$4% are used to obtain the enhanced driving effects between the two corrections for the observed localization at low temperatures. Intrinsic transport properties of strained $LaNiO_3$ films with the characteristic multi-band structure will be discussed.

[1]supported by DOD-ARO and NSF

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Date submitted: 19 Nov 2010 Electronic form version 1.4