Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Coulomb Glass: a Mean Field Study SALVATORE MANDRA, MATTEO PALASSINI, Universitat de Barcelona — We study the Coulomb glass model of disordered localized electrons with long-range Coulomb interaction, which describes systems such as disordered insulators, granular metals, amorphous semiconductors, or doped crystalline semiconductors. Long ago Efros and Shklovskii showed that the long-range repulsion induces a soft Coulomb gap in the single particle density of states at low temperatures. Recent works suggested that this gap is associated to a transition to a glass phase, similar to the Almeida-Thouless transition in spin glasses. In this work, we use a mean field approach to characterize several physical properties of the Coulomb glass. In particular, following a seminal work of Bray and Moore, we show that the Edward-Anderson parameter q_{EA} and the spin glass susceptibility χ_{SG} are directly related to spectrum distribution of the Hessian matrix around free energy minima. Using this result, we show that no glass transition is associated to the gap formation.

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Date submitted: 11 Nov 2011 Electronic form version 1.4