Nonequilibrium Relaxations and Aging Effects near a Metal-Insulator Transition in Two Dimensions\textsuperscript{1} DRAGANA POPOVIĆ, JAN JAROSZYŃSKI, NHMFL/FSU — The relaxations of conductivity $\sigma(t)$ have been studied in the glassy regime of a strongly disordered two-dimensional (2D) electron system in Si after a temporary change of carrier density $n_s$ during the waiting time $t_w$. Two types of response have been observed \cite{jaroszynski_popovic_2007}: (a) monotonic, where relaxations exhibit aging, \textit{i.e.} dependence on history, determined by $t_w$ and temperature; (b) nonmonotonic, where a memory of the sample history is lost. The conditions that separate the two regimes have been determined. A detailed study of the aging regime \cite{jaroszynski_popovic_2007b} reveals an abrupt change in the nature of the glassy phase at the metal-insulator transition (MIT) before it vanishes entirely at a higher density $n_g$. Our results provide further support to theories describing the 2D MIT as the melting of a Coulomb glass, and put constraints on the models of glassy freezing.

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