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**Metal-insulator and glass transitions in a 2D electron system in Si MOSFETs with a screened Coulomb interaction**[1] PING V. LIN, DRAGANA POPOVIĆ, Natl. High Magnetic Field Lab., Florida State Univ. — We present a study of conductivity $\sigma$ of a 2D electron system (2DES) in Si MOSFETs with the oxide thickness $d_{ox} = 7$ nm. In the low density regime of interest, the average electron-electron ($e$-$e$) separation is larger than $d_{ox}$, so that the $e$-$e$ interaction is screened by the metallic gate. The carrier density $n_s$ was changed at a high temperature $T \approx 20$ K, the 2DES was then cooled to a desired $T$ with a fixed $n_s$, and $\sigma$ was measured as a function of time $t$. At the lowest $n_s$, in the insulating regime, transport occurs via variable-range hopping. Near the critical density $n_c$ on the metallic side of the metal-insulator transition (MIT), the time-averaged $\langle\sigma(T)\rangle$ follows a power-law behavior, giving a reliable extrapolation of $\langle\sigma(n_s, T = 0)\rangle$. The critical exponents are discussed and compared to the case of the MIT with long-range Coulomb interactions. The statistical analysis of the fluctuations in $\sigma(t)$ provides evidence for the glassy freezing of electrons for $n_s < n_g$ ($n_c < n_g$) as $T \to 0$, similar to the results on samples with long-range interactions. The data suggest that interacting droplet models, rather than hierarchical pictures of glassy dynamics, might be more appropriate.

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