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Interaction Effects in Conductivity of a Two-Valley Electron System in High-Mobility Si Inversion Layers NIKOLAI N. KLIMOV, Rutgers University, DMITRY A. KNYAZEV, OLEG E. OMEL'YANOVSKII, VLADIMIR M. PUDALOV, Lebedev Physical Institute, HARRY KOJIMA, MICHAEL E. GERSHENSON, Rutgers University — We have measured the conductivity of high-mobility (001) Si metal-oxide-semiconductor field-effect transistors over wide ranges of electron densities $n = (1.8 - 15) \times 10^{11}\,\mathrm{cm}^{-2}$, temperatures $T = 30\,\mathrm{mK} - 4.2\,\mathrm{K}$, and in-plane magnetic fields $B_{\parallel} = 0 - 5\,\mathrm{T}$ [1]. The experimental data have been analyzed using the theory of interaction effects [2] in the conductivity σ of disordered two-dimensional (2D) systems. The parameters essential for comparison with the theory, such as the intervalley scattering time and valley splitting, have been measured or evaluated in independent experiments [1,3]. The observed behavior of σ, including its quasi-linear increase with decreasing T down to $\sim 0.4\,\mathrm{K}$ and its downturn at lower temperatures, is in agreement with the theory. The values of the Fermi-liquid parameter obtained from the comparison agree with the corresponding values extracted from the analysis of Shubnikov–de Haas oscillations based on the theory of magneto-oscillations in interacting 2D systems [4]. [1] N. N. Klimov *et. al.*, PRB **78**, 195308 (2008). [2] G. Zala *et. al.*, PRB **64**, 214204 (2001); **65**, 020201(R) (2001). [3] A. Yu. Kuntsevich *et. al.*, PRB **75**, 195330 (2007). [4] Y. Adamov *et. al.*, PRB **73**, 045426 (2006).

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