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**Evaluation of Quantum Scattering Time in Ultra-High Quality GaAs Quantum Wells** QI QIAN, SUMIT MONDAL, GEOFFREY C. GARDNER, JOHN D. WATSON, MICHAEL J. MANFRA, Purdue Univ — We present a critical analysis of the extraction of quantum scattering time from Shubnikov-de Haas oscillations in ultra-high quality GaAs quantum wells. In the regime of temperature and magnetic field study here ( $T \sim 0.3\text{K}$ ,  $B \leq 0.3\text{T}$ ) we find the canonical method for determination of quantum scattering time yields unreliable results (cf. Coleridge, Phys. Rev. B **44**, 3793). We elaborate a formalism that allows extraction of the quantum scattering time in a regime in which the normalized modulation of the density of states  $\Delta g/g_0$  is greater than unity. This approach describes well low-field data for samples that display very large excitation gaps for fragile fractional quantum Hall states at large magnetic field.

Qi Qian  
Purdue Univ

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