Abstract Submitted
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Quantum selection rules for electron backscattering in wide quantum wells placed in tilted magnetic fields[1] SERGEY VITKALOV, City College of CUNY, WILLIAM MAYER, City College of New York, Graduate Center CUNY, ALEXEY BYKOV, Institute of Semiconductor Physics, Russia — The effect of dc electric field on transport of highly mobile two-dimensional electrons is studied in wide GaAs single quantum wells placed in titled magnetic fields. The study shows resistance oscillates in perpendicular magnetic field due to electric-field induced Landau-Zener transitions between quantum levels that correspond to geometric resonances between cyclotron orbits and periodic modulation of electron density of states. Magnetic field tilt inverts these resistance oscillations. Surprisingly the strongest inverted oscillations are observed at a tilt corresponding to nearly absent modulation of the electron density of states in the regime of magnetic breakdown of semiclassical electron orbits. The effect reveals new quantum selection rules for elastic electron scattering in multi-subband electron systems leading to significant modification of the electron backscattering [1]. [1] William Mayer, Sergey Vitkalov and A. A. Bykov, Phys. Rev. B 93, 245436 (2016)

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