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Floquet Theory of Magneto-Resistivity Oscillations in Microwave Irradiated 2DEGs ASSA AUERBACH, G. VENKETESWARA PAI, Physics Department, Technion — Some remarkable phenomena have been recently observed in semiconductor heterostructures: microwave induced resistivity oscillations (MIRO), Hall induced resistivity oscillations (HIRO), and zero resistance states (ZRS). These effects were seen at weak magnetc fields and high temperatures, where Shubnikov de-Hass oscillations are thermally smeared and the transport is expected to be classical Drude-like. However microwave radiation, or large Hall currents expose the underlying Landau quantization and result in MIRO and HIRO. Theoretically, it is essential to get the full **nonlinear current-field response** in the presence of strong radiation fields and disorder to handle these effects. Here we generalize the Floquet operator approach to incorporate arbitrary large electric fields into the zeroth order evolution operator. We construct the *disordered Floquet evolution operator* which allows us to systematically calculate the nonlinear photocurrent to second order in short range disorder. We derive the magnitude of MIRO from the microscopic parameters. We deduce the optimal conditions of disorder for obse4rving large MIRO and ZRS effects. We determine the characteristic Hall fields detemining the HIRO, and the magnitude of spontaneous ZRS fields. Reference: A. Auerbach and G. V. Pai, Phys. Rev. B **76**, 205318 (2007).

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