

HL 52 Hauptvortrag Mirlin

Zeit: Dienstag 14:15–15:00

Raum: TU P270

Hauptvortrag

HL 52.1 Di 14:15 TU P270

2D electron gas under microwaves: Theory of oscillatory photoresistivity and zero-resistance states — •A.D. MIRLIN^{1,2}, I.A. DMITRIEV¹, M.G. VAVILOV³, I.L. ALEINER⁴, and D.G. POLYAKOV¹ —
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Recent experiments have discovered that the resistivity of a 2D electron gas subjected to microwave radiation exhibits striking magnetooscillations and that at sufficiently high microwave power regions of zero resistance develop. We review the theory of this spectacular phenomena. Considering different mechanisms, we show that leading contribution is due to the effect of the microwaves on the electron distribution function. We analyze the spontaneous formation of the zero-resistance domains, as well as inelastic relaxation due to electron-electron collisions governing the temperature dependence of the effect. We further predict that the above mechanism induces also strong magnetooscillations of the local compressibility. The compressibility measurements should provide information about the domain structure of zero-resistance states. Finally, open questions are discussed.