Sonderforschungsbereich 631

Festkörperbasierte Quanteninformationsverarbeitung

TECHNISCHE UNIVERSITÄT MÜNCHEN

SEMINAR ANNOUNCEMENT

Tuesday, 02nd March 2004

05.15 p.m.

WSI, seminar room S 101

„Novel zero-resistance states induced by photoexcitation in the high mobility two-dimensional electron system„

We report the experimental detection of novel zero-resistance states [1], which are induced by electromagnetic wave excitation in ultra high-mobility GaAs/AlGaAs heterostructure devices including a two-dimensional electron system. Radiation-induced vanishing-resistance states, which do not exhibit concomitant Hall resistance quantization, are demonstrated in the large filling factor, low magnetic field limit, at liquid helium temperatures. It is shown that the observed resistance minima follow the series B = [4/(4j+1)] Bf with j=1,2,... where Bf=2pi*f*m/e, m is an effective mass, e is electron charge, and f is the radiation frequency. The dependence of the effect is reported as a function of experimental parameters such as the electromagnetic wave frequency, incident power, temperature, and the current.

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