

## Quantum Hall effect and the critical behaviour of the 2DEG in an InGaAs/InP heterostructure

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The plateau-plateau (PP) and plateau-insulator (PI) transitions are investigated in the quantum Hall regime. Special attention is paid to the critical behaviour of both types of transition. We use the same sample as Wei and co-workers [Phys.Rev.Lett. **61** (1294) 1988], who reported scaling behaviour with a universal exponent  $\kappa = 0.42$  for several PP transitions measured in magnetic field up to 10 T.

Here we present new data taken in magnetic fields up to 30 T, which enable us to also include the PI transition ( $B_c \sim 26$  T). We found that the PI transition demonstrates proper scaling behaviour with critical exponent  $\kappa = 0.58$ .

In case of the PP transition the scaling is not confirmed, although the raw experimental data look similar to those reported by Wei *et al.* We suggest that the scaling behaviour in this case is hampered by macroscopic sample inhomogeneities. By numerical simulation of the transport data, we are able, for the first time, to demonstrate the detrimental effect of inhomogeneities on the scaling behaviour and the value of the critical exponent measured for PP transitions. In particular we show that the previously reported value for the PP transition  $\kappa = 0.42$  is not correct.

