Coherence length in the quantum Hall effect KESHAV SHRIVAS-
TAVA, University of Malaya — The Hall effect resistivity plateau has only one e
and hence only one electron and h/e comes from the flux quantization. Hence the
number of electrons at the plateau is one or a small number. As the field moves
away from the plateau, there is a phase transition from single electron state to a
cluster state. As the field further moves, the cluster breaks and single/small particle
state is formed again. The coherence length which depends on the temperature,
determines the variation of resistivity as a function of magnetic field. The expo-
nent of temperature which determines $\partial R/\partial B$ is the inverse of the exponent of the
coherence length. At the plateau the electrons are localized according to the Ander-
son model except that the plateau location depends on spin. [1] K. N. Shrivastava,
AIP Conf. Proc.1017,47-56(2008); 1017, 422-428(2008); 1136, 469-473(2009); 1150,
59-67(2009); 1169, 48-54(2009).

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