

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

A comparative study of the reentrant integer quantum Hall states in the second and third Landau levels NIANPEI DENG, JOHN WATSON, MICHAEL MANFRA, GABOR CSATHY, Purdue University — In the two-dimensional electron gas competing electron-electron interactions and disorder effects give rise to many-body ground states such as the fractional quantum Hall and the reentrant integer quantum Hall states (RIQHS). The latter are not yet well understood, but they are believed to be Wigner crystal-like electron solids with one or more electrons at each lattice nodes. We have recently shown that for the RIQHS in the second Landau level one can extract their onset temperature from the temperature-dependent magnetoresistance. We report similar studies of the RIQHS in the third Landau level. To our surprise, the onset temperatures of the RIQHSs in the third Landau level are about a factor of 3 larger than those in the second Landau level. This result clearly shows that the RIQHSs in the second and third Landau level have vastly different cohesion energies and may indicate different internal symmetries for these states. This work was supported by the DOE grant DE-SC0006671.

Nianpei Deng
Purdue University

Date submitted: 10 Nov 2011

Electronic form version 1.4