

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Nanoscale Potential Fluctuations in (GaMn)AsGaAs Heterostructures: From Individual Ions to Charge Clusters and Electrostatic Quantum Dots PAUL KOENRAAD, INEKE WIJNHEIJMER, JENS GARLEFF, Eindhoven University of Technology, OLEG MAKAROVSKY, LAURENCE EAVES, RICHARD CAMPION, BRYAN GALLAGHER, University of Nottingham — During growth of the dilute p-type ferromagnetic semiconductor GaMnAs, interstitial manganese is formed when the Mn concentration exceeds 2%. This interstitial Mn acts as a double donor which compensates the free holes that mediate ferromagnetism. Annealing causes out-diffusion of these interstitials, thereby increasing the Curie temperature. Here, we use cross sectional scanning tunneling microscopy and spectroscopy to visualize the potential landscape which arises due to the clustering of interstitial Mn in annealed p-i-n (GaMn)As-GaAs double barrier heterostructures. We map the local minima in the potential landscape, link them to clusters of individual interstitial Mn ions, and show that the ions are doubly charged.

Paul Koenraad
Eindhoven University of Technology

Date submitted: 23 Nov 2010

Electronic form version 1.4