

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Probing ErAs nanoparticle density of states using capacitance-voltage¹ KASEY RUSSELL, VENKATESH NARAYANAMURTI, Harvard University, JOSHUA ZIDE, ARTHUR GOSSARD, UC Santa Barbara — Two asymmetric $\text{In}_{0.53}\text{Ga}_{0.47}\text{As}/\text{In}_{0.53}\text{Al}_{0.47}\text{As}$ double-barrier samples are fabricated and compared using low-temperature capacitance-voltage measurements. The two samples are identical except for a layer of ErAs nanoparticles embedded within the quantum well layer of one of the samples. A clear difference in the capacitance-voltage profile is observed between the two samples, and the difference is attributed to additional available states associated with the ErAs nanoparticles. These results are compared with a charge-step simulation of the low-frequency capacitance of the device in order to estimate the density of states contributed by the ErAs nanoparticles.

¹Supported by the Office of Naval Research through ONR/MURI and NSF/NNIN through use of Harvard's Center for Nanoscale Systems.

Kasey Russell
Harvard University

Date submitted: 27 Nov 2007

Electronic form version 1.4