Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Raman Spectroscopy of InAs/GaAs Quantum Dots Patterned by Nano-indentation MARTIN MUNOZ, Physics Department, Virginia Commonwealth University, LINDSAY HUSSEY, Physics Department, Virginia Commonwealth University, DURIG LEWIS, Physics Department, Virginia Commonwealth University, CURTIS TAYLOR, Mechanical Engineering Department, Virginia Commonwealth University, EUCLYDES MAREGA, Department of Physics, University of Arkansas, AJAY MALSHE, Mechanical Engineering Department, University of Arkansas — Patterns of InAs/GaAs quantum dots (QDs) grown by the combination of nanoindentation technique and molecular beam epitaxy were studied. The resulting QDs tend to preferentially nucleate on indented areas rather than other regions. We studied the strain on the indentations, regions surrounding the indents, and non-indented areas. The QD LO mode for the patterned areas shifted by 8 cm-1 when compared to the non-patterned area. The biaxial strain in the indented areas producing this shift is four times larger than that in non-indented areas, explaining the QD preference within these areas. This larger strain suggests that QDs on the indentations can be formed by depositing a smaller InAs amount than that required to form QDs on non-indented areas, thus obtaining QDs only on the pattern.

Martin Munoz
Physics Department, Virginia Commonwealth University

Date submitted: 30 Nov 2005 Electronic form version 1.4