Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Quantitative structural characterization of annealed InAs/GaSb superlattices[1] GE LIU, BERND FRUHBERGER, IVAN K. SCHULLER, Department of Physics, University of California, San Diego, HEATHER J. HAUGAN, GAIL J. BROWN, Air Force Research Laboratory — MBE grown InAs/GaSb superlattices without *in situ* thermal processing were post-growth annealed in vacuum and analyzed by a combination of XRD and structural refinement. The refinement shows a FWHM of satellite peak broadening and a d-spacing contraction in InAs constituent layers, which are caused by interfacial roughness and inhomogeneous strain, when the annealing temperature is above 200 ^{o}C. Furthermore, the annealing above 450 ^{o}C destroys the superlattice structure and annihilates all satellite peaks. An additional series of satellite peaks showing InSb-like behavior was found in annealed superlattices which is reduced by further annealing at 200 ^{o}C. The refinement reveals that these peaks arise from the "superlattice" composed of InSb-like structure. The surface morphology studied using AFM shows that the InAs/GaSb superlattice surfaces evolve from flat plane, porous structure, and pebble structure to island structure as the annealing temperature increases.

[1]This work was supported by AFOSR MURI # F49620-02-1-0288.

Ge Liu
Department of Physics, University of California, San Diego

Date submitted: 25 Nov 2006 Electronic form version 1.4