Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Epitaxial growth of quantum-well photovoltaic structures on silicon substrates using beryllium chalcogenide interlayers KEVIN CLARK, EDUARDO MALDONADO, R.T. BATE, W.P. KIRK, NanoFAB Center, University of Texas at Arlington — Epitaxial integration of wide-bandgap p-n junctions on silicon forms an approach for high-performance multijunction space power solar cells. Heteroepitaxy on silicon has materials incompatibilities associated with stacking faults from lattice and thermal mismatch, polar-on-nonpolar growth, cross diffusion etc. Beryllium telluride (BeTe) is a II-VI semiconductor nearly lattice-matched to gallium arsenide and has good growth characteristics on silicon, with planar two-dimensional growth and high stacking fault energy. We have grown AlGaAs p-i-n structures incorporating GaAs quantum wells on BeTe interlayers on arsenic-passivated silicon substrates by molecular beam epitaxy. We report growth characteristics, current-voltage characteristics, and photocurrent results for the structures.

Kevin Clark
NanoFAB Center, University of Texas at Arlington

Date submitted: 30 Nov 2004 Electronic form version 1.4