Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

P-type InSb and $In_xGa_{1-x}As$ quantum wells remotely doped with Be CHOMANI GASPE, MADHAVIE EDIRISOORIYA, TETSUYA MISHIMA, MICHAEL SANTOS, University Of Oklahoma — CMOS circuits require $p-$type transistors with high hole mobility, in addition to $n$type transistors with high electron mobility. We have observed room-temperature hole mobilities of 100 and 600 cm^2/Vs in $In_xGa_{1-x}As$ and InSb quantum wells, respectively. The $In_xGa_{1-x}As$ wells are remotely doped with Be in $In_xAl_{1-x}As$ barrier layers, and grown on InP substrates. The InSb wells are remotely doped with Be in $Al_xIn_{1-x}Sb$ barrier layers, and grown on GaAs substrates. We will discuss the effects of strain, structural parameters, and defect density on hole mobility in InSb and $In_xGa_{1-x}As$ quantum wells. In zinc-blende semiconductors, a narrower band gap leads to smaller effective masses for electrons and holes. Strain and confinement increase the energy splitting between holes with light in-plane mass and those with heavy in-plane mass. This work was supported by the NSF Grants DMR-0808086 and DMR-0520550.

Chomani Gaspe
University Of Oklahoma

Date submitted: 26 Nov 2008 Electronic form version 1.4