Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Power and temperature dependent photoluminescence investigation of the linear polarization at normal and inverted interface transitions in InP/InAlAs and InGaAsP/InAlAs QW structures HAMIDREZA ESMAIELPOUR, VINCENT R. WHITESIDE, University of Oklahoma, LOUISE C. HIRST, United States Naval Research Laboratory, DAVID V. FORBES, Rochester Institute of Technology, ROBERT J. WALTERS, United States Naval Research Laboratory, IAN R. SELLERS, University of Oklahoma — We present an investigation of the interface effects for InGaAsP/InAlAs QW and InP/InAlAs QW structures capped with an InP layer. Continuous wave photoluminescence (PL) spectroscopy of these samples at 4 K shows features associated with the interfaces of an InAlAs layer grown on an InP layer (normal interface) and an InP layer grown on an InAlAs material (inverted interface). Power dependent PL of the InGaAsP QW indicates that there are two features related to the inverted interface, whereby the linear polarization of one increases and for the other decreases. In addition, a temperature dependent study of this sample shows that as the temperature increases: the linear polarization for both features decreases; at room temperature, there is negligible polarization effect. A power dependent PL study of the InP QW structure shows both normal and inverted interface transitions have opposing trends in linear polarization. Notably, the temperature dependent PL investigation displays a reduction of polarization degree for the inverted interface: as expected; while an increase of polarization for the normal interface was observed. In addition, power and temperature dependence of peak energy of the interface transitions for both samples will be presented.

Hamidreza Esmaielpour
University of Oklahoma

Date submitted: 10 Nov 2016 Electronic form version 1.4