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Improving the Photoluminescence Characteristics of Contacting InP/InGaAs Quantum Wells

The goal of my project is to reduce the effect of interface electron states on the photoluminescence of contacting InP/InGaAs quantum well heterostructures. This is part of a larger project which is attempting to demonstrate variable coupling of electron states for use in devices such as tunable infrared detectors. To demonstrate this concept, we have fabricated collapsed cantilever structures, shaped much like a diving board of InP/InGaAs that is pinned to the substrate at its tip. Our cantilever devices rely on stiction to collapse onto the substrate, providing us with a variable air gap between two quantum wells. As a consequence, the interface of the contacting quantum wells at the collapsed tip of the cantilever lies between two separate crystals. This introduces interface states which hinder the photoluminescence of our devices. Annealing has been the primary solution tested to bond the two quantum wells and diminish the effect of these interface states.



Poster Number: Session: