



Resonant Second Harmonic Generation of Mid-infrared Radiation in InAs/AlSb Coupled Quantum Wells

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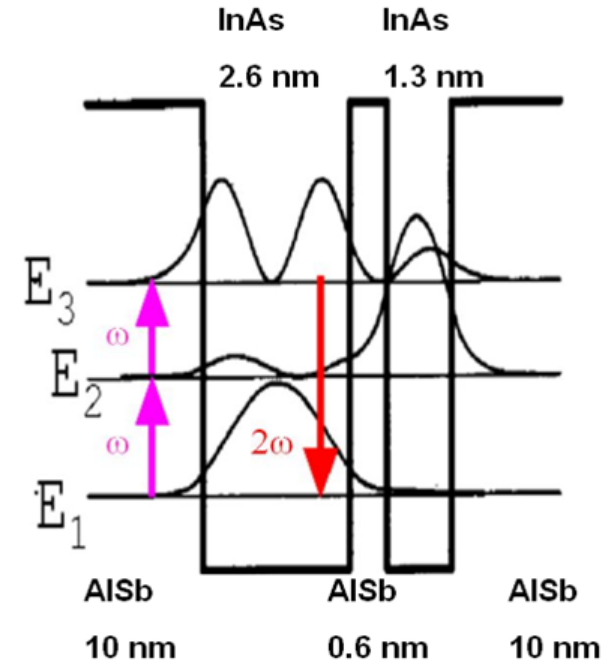
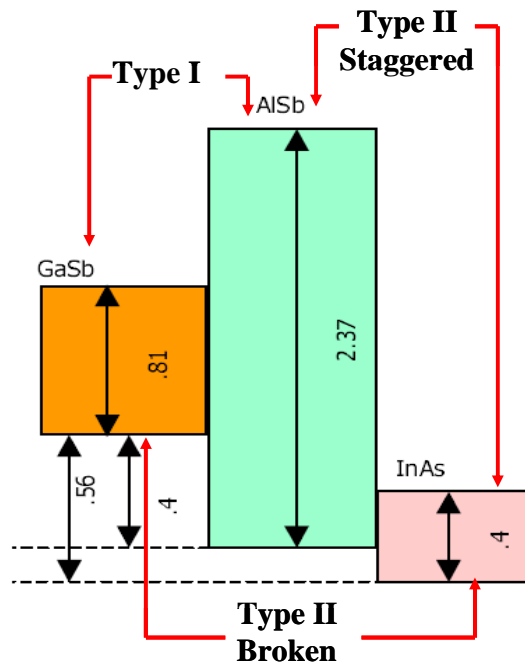
Background

- The resonant fingerprint frequencies of many molecules located in the mid-IR range
 - Trace gas detection possible through analysis of the absorption spectra
- Adequate sources and detectors needed
 - Compact and Inexpensive
 - Room temperature operative
 - Utilize SHG to push lasers below $4\mu\text{m}$
- This project focuses on developing materials for appropriate mid-IR sources



The Solution!

- 6.1 Angstrom Semiconductors
 - Large conduction band offset
 - Wide range of achievable bandgaps



- InAs/AISb Quantum Wells
 - Observe intersubband transitions
 - Resonantly enhance SHG