High Energy Intersubband Transitions in InAs/AlSb QWs

Diane Larrabee, Jun Kono, Rice University, Shigeiko SASA, Yoji Nakajima, Masato Nakai, Masashi FuruKawa, MasatakA InouE, Osaka Institute of Technology — InAs/GaSb/AlSb heterostructures are a promising material system for intersubband optically-pumped applications due to their large conduction band offsets (≈2 eV in InAs/AlSb). Applications include FIR generation and ultrafast all-optical switching at the communication wavelength of 1.55 μm. We have observed intersubband absorption at $E_{12}$ up to 670 meV (1.85 μm) in 2.1 nm Si-doped InAs/AlSb QWs. We have also attempted THz generation by difference frequency mixing in resonant InAs/AlSb asymmetric double quantum wells.