

Jordan University of Science and Technology

Gain-Clamped Quantum Dot Semiconductor Optical

Authors: Omar Qasaimeh

Abstract: The linear optical gain of gain-clamped quantum dot semiconductor optical amplifiers (GCSOAs) has been investigated and studied for different energy detuning, doping concentration and different device length. Our analysis shows that large linear optical gain can be obtained when the laser emits 90meV above the ground state and the amplifier operates at the ground state which results in 81meV separation between the laser and amplifier energy. We find that larger detuning between the laser and amplifier energy result in gain saturation. Also we find that for positive L A ?? ??? doping the dots by P-type concentration enhances the linear optical gain while doping the dots by N-type concentration reduces the linear optical gain. While for negative L A ?? ??? doping the dots by N-type concentration enhances the linear optical gain while doping the dots by P-type concentration reduces the linear optical gain.