



# Σ Ε Μ Ι Ν Α Ρ Ι Ο

## Carrier Confinement in Quantum Well Laser Structures & Quantum Dot Qubits

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**Vasilios N. Stavrou**

Applied Physics Lab

Hellenic Naval Academy

### Abstract

A theoretical/numerical description of the carrier confinement and the evaluation of phonon modes in low dimensional structures (LDS), like semiconductor quantum wells (QWs) and quantum dots (QDs), will be presented. These kinds of structures have attracted considerable interest in various novel optoelectronic devices due to their highly tunable electronic and optical properties. The semiconductor laser technology and the quantum computer architectures, based on semiconductor quantum bits (Qubits), have worldwide used the QWs and QDs structures, among others. In the case of the above mentioned LDS, the numerical estimation of parameters concerning the electron scattering processes via the emission of phonons, the spin flip-flop, the dephasing mechanism and the light interplay with matter, will be extensively discussed.