Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Calculation of Energy States for Multi-Layer GaAs-AlGaAs Semiconductor Laser CHIN-SHENG WU, Yuan Ze University — .Semiconductor laser operation requires high frequency performance. Multi-layer Quantum wells are effective prameters in semiconductor lasers because they allow some extra degree of freedom in the design of the desired emitted wavelength through adjustment of the wells numbers in addition to width w around 15 nm and barrier height V around 300 meV. Those wells are to provide the potential term of the Schrödinger equation Dispersion relation between the energy and wave number increases the first term of the Schrödinger equation, which is the kinetic energy. Hence dispersion relations in conduction band and valence band are applied for the effective mass approximation. We also add the exchange-correlation energy into the Schrödinger equation. Alternating GaAs-AlGaAs layers produce a variety of energy states. Transitions among states are related to laser frequencies. Because of the presence of multi-layer quantum wells the electrons have discrete energies and these appear as peak in the absorption measurements.

Chin-Sheng Wu
Yuan Ze University

Date submitted: 05 Oct 2012 Electronic form version 1.4