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RELATIONSHIP BETWEEN THE GROUND ENERGY LEVEL AND THE WELL – WIDTH OF ONE – DIMENSIONAL KRONIG – PENNY MODEL OF GaAs/AlGaAs. FOR ELECTRON, LIGHT HOLE AND HEAVY HOLE USING POWER SERIES EXPANSION

D. A. AJADI, O. M. ONI & K. S. OLASUNKANMI

Department of Pure and Applied Physics, Ladoke Akintola University of Technology. Ogbomosho, Nigeria

ABSTRACT

Computational analysis of the dispersion equation of the simplest Kronig – Penney Model for a general one – dimensional periodic potential was analyzed using power series expansion. The resulting solution obtained when the first term of the expansion series was used, shows that the energy of a particle, Electron (E); Light Hole (LH) and Heavy Hole (HH) can never be zero as the well-width increases and that it has a minimum value at very large well-width.

The result also shows that the use of different effective mass of E, LH, and HH in the potential well and the barrier provide the distinct differences between their eignvalues even though they all obey the similar power law.

KEYWORDS: Kronig – Penney Model, GaAs/AlGaAs, Schrodinger Equation