



SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	Physical Science International Journal
Manuscript Number:	Ms_PSIJ_37435
Title of the Manuscript:	Multi-Phonon Raman Scattering in GaAs/Al _{0.28} Ga _{0.72} As Super-lattice
Type of Article:	

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	Authors' response to final evaluator's comments
<p>*Abstract We think that the peak at 290 cm⁻¹ may be caused by emission of a longitudinal optical phonon in GaAs/Al_{0.28}Ga_{0.72}As super-lattice, Exclude assumption wordings such as we think as this is a scientific research paper and therefore the findings should be backed by scientific study.</p> <p>*Figure 1(b) shows result. Should be under Subsection 3.0.</p> <p>*Comparing it with transverse optical waves with wave number 269cm⁻¹ [8]not superscript for GaAs, obviously, there is a difference of 2cm⁻¹, it is resulting from the influence of interface modes of GaAs/Al_{0.28}Ga_{0.72}As super-lattice⁽⁹⁾</p> <p>References must be listed at the end of the manuscript and numbered in the order that they appear in the text. Every reference referred in the text must also present in the reference list and vice versa. In the text, citations should be indicated by the reference number in brackets [3]. Needs correction for the whole article. Refer http://www.sciencedomain.org/page/general-guideline-for-authors#Type_of_papers</p> <p>(3) For the GaAs/Al_{0.28}Ga_{0.72}As super-lattice whose parameters are given as above, its band gap energy can be calculated to be E_g(sup.)=1.522eV⁽¹⁰⁾.</p> <p>Send the article for proof reading before resubmitting.</p>	<p>Thank you ,evaluator, for your comments. I have finished corrections in evaluator's opinion. The reference (11) that you need was published in Chinese . The part you care about is now translated into English for your reference.</p> <p>2.Theoretical analysis</p> <p>The ground state energy level of electrons in Quantum well can be calculated using the following formula ⁽¹⁾</p> $E_0 = \left(\frac{\pi}{2} \frac{a_c}{L_w + \Delta L_w} \right)^2$ <p>Where $a_c = \frac{2\hbar}{\sqrt{2m_w^*}}$, $\Delta L_w = \frac{a_c}{\sqrt{b_c \cdot \Delta E_c}}$, $b_c = \frac{m_w^*}{m_b^*}$,</p> <p>The energy difference between the bottom of the GaAs / Al_xGa_{1-x}As conduction band is $\Delta E_c = 0.65\Delta E_g$ ⁽²⁾, and the bandgap difference of the two materials is $\Delta E_g = 1.247x$. The effective masses of an electron in GaAs well layer and in Al_xGa_{1-x}As barrier layer are $m_w^* = 0.067m_0$, and $m_b^* = (0.067 + 0.083x)m_0$ ⁽³⁾, respectively. letting $x = 0.28$, $L_w = 48\text{\AA}$, substituting them into the above formula. The ground state energy level of electrons in quantum well can be calculated to be</p> $E_0 = 78 \text{ meV}$ <p>i.e., the ground state energy of the electron in quantum well of the conduction band lie at 78 meV above the bottom of the GaAs conduction band. If the effective mass of a heavy hole in GaAs well layer and in Al_xGa_{1-x}As barrier layer is $m_{vw} = 0.62m_0$, $m_{vb} = (0.62 + 0.14x)m_0$ ⁽³⁾, respectively, $\Delta E_v = 0.35\Delta E_g$, similarly, using above formula the ground state energy level of the heavy holes in quantum well of valence band can be calculated to be</p> $E_{h0} = 16\text{meV},$ <p>i.e., E_{h0} locate at 16meV below top of GaAs valence band .</p> <p>It is known that the band-gap of GaAs at room temperature is E_g = 1.428 eV. Therefore, it can be considered that the band-gap of this GaAs / Al_{0.28}Ga_{0.72}As quantum well structure material is E_G = 1.428 + (0.078 + 0.016) = 1.522 eV. It Can be written as $\hbar\omega_G = 1.522\text{eV}$, ω_G is the transition frequency of the electrons in the quantum well of valence band transiting to the ground state of electrons in quantum well of conduction band .</p>