Analysis of Quantum Dots in Modified Coulomb Potential

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Abstract

Quantum theory is one of the most successful theories that have influenced the course of scientific progress during the twentieth century. It has presented a new line of scientific thought, predicted entirely inconceivable situations and influenced several domains of modern technologies; in addition to all this it has added a new dimension to the conceptual framework related to the microscopic systems. However, in spite of its enormous success it is baffling even to the hardcore physicists. The very notions of causality, determinism, and measurement need to be redefined and in spite of all this there are almost mysterious situations that are to be faced by anyone familiar with it.

In this paper we are putting forth a radical step in terms of reformulation of Coulomb Potential at low dimensionality to solve the long standing problem of Divergences. This reformulation of Coulomb at low dimensions is further tested by its application to Quantum Dots which are good candidates for testing the validity of the given reformulation. We have calculated energy eigen values and also solved Schroedinger Wave Equation for the modified potential to predict the behaviour of wave function which should be seen in the experiments on Quantum Dots. Hence this paper puts forth a new radical idea in Quantum Dot technology by modification of Coulomb Potential to predict new physics at the nanoscale.

Keywords: Coulomb Potential, divergences, quantum dot, hyper geometric functions.

Figures:

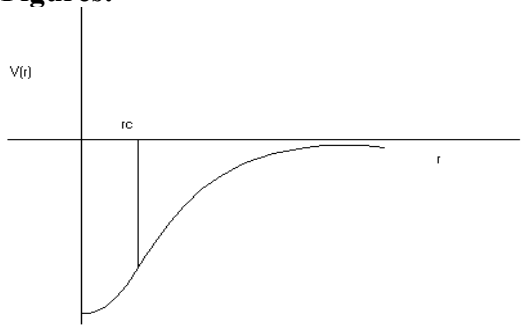

Fig1. The graphical representation of the Modified Coulomb potential

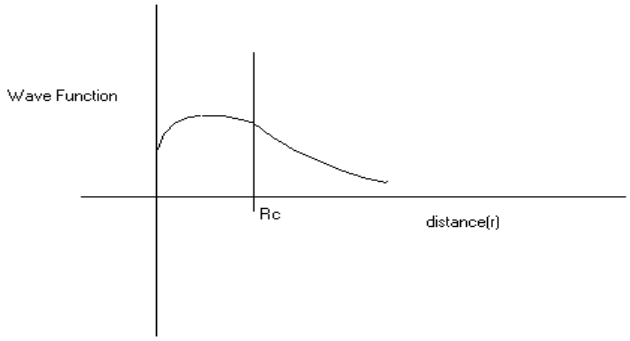

Fig 2: Plot of Wave Function Vs. distance in a Quantum Dot