EXACT SOLUTIONS OF DIRAC EQUATION IN 2-D GRAVITAIONAL FIELD

VOLKAN UNCU
volkanuncu_984@hotmail.com

To understand the dynamics of scalar and spinor particles, one needs to solve Kelvin-Gordon and Dirac equations. Nevertheless, it is very laborious to solve these equations in a 3+1 dimensional curved field. One of these effortless methods are weak field approach and the other is asymptotic solutions. But the easier approach to find the complete solutions is to decrease the number of dimensions and solutions can be extended to higher dimensions.

Here, the supersymmetric quantum mechanical technics are used to solve the Kelvin-Gordon equation in static two (t-x) dimensions. Moreover, if this method is applied to solve the Dirac equation in static flat space-time, as a result the energy spectrums can be derived. In this approach, we are planning to find the solution by supersymmetric quantum mechanical formalism.

ON THE QUANTUM COMPUTATION AND QUANTUM INFORMATION

NECATİ ÇELİK, M. NURİ URAL AND SELİM KAYA
necati.celik@gumushane.edu.tr

Quantum mechanics is considered to be the most important achievement and mysterious scientific theory in mid-1900. Then it was successfully applied to understand a wide variety of physical phenomena including fundamental forces of nature, nuclear physics, superconductors etc. Toward the end of 1900, people began to ask whether a quantum system can actually be designed instead of looking at them just a phenomena found in nature. Some of the question of interests are: what are the fundamental physical limitation son space and time required to construct a quantum state? What makes quantum systems difficult to simulate by conventional classical means? In this study we present the quantum bit and compare it with classical bit; the main difficulties faced when a quantum systems is aimed to be simulated, frequently used quantum gates.

Key Words: Quantum computation, Quantum Information, Quantum gates