Funded Research Projects

Proposed Format:

Project Title :  
*N-qubit bipartite entanglement dynamics with emphasis on entanglement preservation*

Project Proponent :  Eric A. GALAPON

Designation of Proponent :  

Department and College Proponent :  National Institute of Physics, College of Science

Project Abstract :  Ever since the publication of the EPR paper, the phenomenon of entanglement has attracted a lot of interest and attention. The past decades have witnessed its transformation from being an anomaly in quantum mechanics to becoming one of its most non-classical features. Furthermore, it plays a very important role in quantum information processing, in particular coding. Hence, entanglement has stimulated a lot of research on various ways to quantify, control and preserve it. The latter is particularly important since entanglement is so fragile that interactions with the environment may lead to an asymptomatic decay or a sudden death of entanglement. Therefore, preservation of entanglement is very crucial if it is to serve as a resource in the first place. This fact entails the theoretical study of the dynamics of entanglement. From this analysis, one is able to pinpoint circumstances surrounding the evolution of the system that favors entanglement preservation.

A number of papers have been done regarding entanglement preservation and these could be classified under variants of two schemes, one which employs the quantum Zero effect and the other which uses detuning modulation. However, the former scheme is relatively difficult since one has to perform as a series of measurements to the system during the course of the evolution while for the latter, entanglement is not preserved in the long-time limit.

With these in mind, it is the objective of this research to develop and expand on a new scheme without the disadvantages of the aforementioned schemes. It involves preparing entangled qubits and letting them evolve with other qubits immersed in a common environment.

Funding Support in Philippine Pesos :  300,000.00

Duration and Status :  12 months

Contact Information of Project Proponent :  
