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Open Quantum Theory of two Entangled Atoms in De-Sitter Space

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In this paper, our prime objective is to investigate the thermal nature of the de- Sitter space generated due to the entanglement between a pair of Unruh-De-Witt detectors in the paradigm of open quantum systems. The Master-equation of pair of a two-level atomic system within a framework of weakly interacting limit in the de-Sitter space is solved. One of the most important phenomena occurring due to the vacuum-fluctuations of a conformally coupled scalar field is the Casimir effect is studied in the framework of open quantum systems with a weakly-interacting environment degrees of freedom. Such vacuum fluctuations enhance the entanglement between the two atoms thereby resulting in the thermalization of the space-time and encodes the Unruh Effect into it. We study how the Resonance Casimir- Polder interaction between the two atoms manifests the curvature of space-time. Another main objective of this paper is to investigate the asymptotic entanglement between the two atoms giving rise to an ensemble of thermal states encoded within the vacuum state of the scalar field. These thermal phenomena is obtained by the Gibbons-Hawking temperature is widely studied with respect to various toy model Hamiltonian for an entangled pair of atoms weakly conformally coupled to a scalar field.

Summary

In this paper, our prime objective is to investigate the thermal nature of the de- Sitter space generated due to the entanglement between a pair of Unruh-De-Witt detectors in the paradigm of open quantum systems. The Master-equation of pair of a two-level atomic system within a framework of weakly interacting limit in the de-Sitter space is solved. One of the most important phenomena occurring due to the vacuum-fluctuations of a conformally coupled scalar field is the Casimir effect is studied in the framework of open quantum systems with a weakly-interacting environment degrees of freedom. Such vacuum fluctuations enhance the entanglement between the two atoms thereby resulting in the thermalization of the space-time and encodes the Unruh Effect into it. We study how the Resonance Casimir- Polder interaction between the two atoms manifests the curvature of space-time. Another main objective of this paper is to investigate the asymptotic entanglement between the two atoms giving rise to an ensemble of thermal states encoded within the vacuum state of the scalar field. These thermal phenomena is obtained by the Gibbons-Hawking temperature is widely studied with respect to various toy model Hamiltonian for an entangled pair of atoms weakly conformally coupled to a scalar field.

Primary authors: Prof. PANDA, Sudhakar (Director, NISER, Bhubaneswar); Dr CHOUDHURY (Max Planck Institute for Gravitational Physics, Potsdam.)

Presenter: Dr CHOUDHURY (Max Planck Institute for Gravitational Physics, Potsdam.)

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