



**DEPENDENCE OF ENTANGLEMENT IN A SYSTEM OF A
THREE-LEVEL ATOM INTERACTING WITH A NON-
CORRELATED TWO-MODE CAVITY FIELD ON
THE THREE-LEVEL CONFIGURATION**

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Abstract

We investigate the evolution of the atomic quantum entropy and the atom-field entanglement in a system of an atom with three levels in a different-configuration (Λ , Ξ and V) interacting with a non-correlated two-mode cavity field. With the derivation of the unitary operator within the frame of the dressed state and the exact results for the state of the system we perform a careful investigation of the temporal evolution of the von Neumann entropy as a measure of entanglement. The differences in entanglement degree between the three configurations besides the effects of the mean photon number and detuning on the entropy are discussed, considering the fields to be initially in a coherent state.

Keywords and phrases: entanglement, quantum entropy.