

Abstract Submitted
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Quantum Computing using Photons AHMED ELHALAWANY,
MICHAEL LEUENBERGER, University of Central Florida — In this work, we propose a theoretical model of two-quantum bit gates for quantum computation using the polarization states of two photons in a microcavity. By letting the two photons interact non-resonantly with four quantum dots inside the cavity, we obtain an effective photon-photon interaction which we exploit for the implementation of an universal XOR gate. The two-photon Hamiltonian is written in terms of the photons' total angular momentum operators and their states are written using the Schwinger representation of the total angular momentum.

Ahmed Elhalawany
University of Central Florida

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