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Entanglement of movable mirrors in a correlated emission laser[1]
WENCHAO GE, Institute for Quantum Studies and Department of Physics, Texas A&M University, College Station, Texas 77843, USA, HYUNCHUL NHA, Texas A&M University at Qatar, Education City, P.O. Box 23874, Doha, Qatar, M. SUHAIL ZUBAIRY, Institute for Quantum Studies and Department of Physics, Texas A&M University, College Station, Texas 77843, USA — We investigate the theory of entangling two macroscopic mechanical resonators (movable mirrors) through two-mode fields generated by a correlated emission laser source inside a doubly resonant cavity. The master equations and quantum Langevin equations are studied for the atomic system and field-mirror system respectively. We show that steady state entanglement of mirrors as well as two-mode fields can be obtained in the strong field-mirror interacting regime for the input laser frequencies both tuned at the anti-Stokes sidebands. The entanglement of movable mirrors and two-mode fields can be tuned on and off by the driving field which controls the atomic system in our case. Our scheme is able to entangle two macroscopic objects with state-of-art experiment.

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