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**Temperature difference induced entanglement of a two-level atom and a thermal field** HAN XIONG, FULI LI, M.S. ZUBAIRY, Institute for Quantum Studies and Department of Physics, Texas A&M University, Texas 77843, USA — The interaction of a two-level atom and a field which are both initially prepared in thermal states has been studied by use of the Jaynes-Cummings model. We show that entanglement between the atom and the field can arise when the temperature difference between them are sufficiently large. This entanglement cannot be created when the atom and the field are in thermal equilibrium, however, a unitary transformation can always be applied on the atom to destroy the thermal equilibrium and thus create entanglement.

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