Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Non-Markovian Quantum Limit for Driven Open Quantum Systems ANDRÉS ESTRADA-GUERRA, LEONARDO A. PACHÓN, Univ de Antioquia — The observation of quantum features at macroscopic scales, like superconductivity, interference fringes of massive many-atoms molecules [1], coherent superpositions in Bose-Einstein condensates [2], and superconductivity make the border between the quantum and classical realms diffuse and intricate. It is commonly accepted that in order to observe these quantum features, one needs to reach the low temperature regime, that is, the typical energy of the system must be greater than the thermal fluctuations. Our work aims to show that, even in the high temperature regime, some quantum features such entanglement can be present if the system is placed out from equilibrium. In particular, we study the non-Markovian dynamic of two different resonators coupled to different baths at different temperatures and with different coupling-to-the-bath-strengths. We found that entanglement between the resonators can be created and maintained in the long-time regime, a processes that is assisted by the driving and by the non-Markovian dynamics. We also derive a new relation between the parameters of the system leading to the survival of entanglement.

[1] K. Hornberger *et al.*, New J. Phys. **11**, 043032 (2009).
[2] M. R. Andrews *et al.*, Science **275**, 637 (1997

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Date submitted: 15 Nov 2013 Electronic form version 1.4