

Abstract Submitted  
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**Entanglement and Coherence: Differences and Similarities**

ROBERT O'CONNELL, Louisiana State University, Physics Dept. — Entanglement and coherence both decay due to environmental (heat bath) effects. Apart from the well-known fact that decoherence occurs exponentially and disentanglement occurs with a sudden death, there are many other differences. Here, we concentrate on the effects of temperature  $T$  along in the absence of dissipation. Thus, whereas the effect of  $T$  on decoherence increases exponentially with time [1], the effect of  $T$  on disentanglement is constant for all times [2], reflecting a fundamental difference between the two phenomena. Also, the possibility of disentanglement at a particular  $T$  increases with decreasing initial entanglement. Supported in part by NSF under Grant No. ECCS-0757204.

- [1] G. W. Ford and R. F. O'Connell, Phys. Lett. A 286, 87 (2001).
- [2] G. W. Ford and R. F. O'Connell, Phys. Scr. 82, 038112 (2010).

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