

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Disappearance of entanglement: a topological point of view¹

DONG ZHOU, ROBERT JOYNT, GIA-WEI CHERN, JIANJIA FEI, University of Wisconsin-Madison — We give a topological classification of the evolution of entanglement, particularly the different ways the entanglement can disappear. Four categories exhaust all possibilities given the initial quantum state is entangled and the final one is not. Exponential decay of entanglement, entanglement sudden death and sudden birth can all be understood and visualized in the associated geometrical picture - the polarization vector representation. The entanglement evolution categories of any model are determined by the topology of the state space, the limiting state and the memory effect of the environment. Transitions between these types of behaviors as a function of physical parameters are also possible. These transitions are thus of topological nature. We illustrate the general concepts with a visualizable model.

¹NSF-DMR-0805045, the DARPA QuEST program, and by ARO and LPS W911NF-08-1-0482

Dong Zhou
University of Wisconsin-Madison

Date submitted: 15 Nov 2010

Electronic form version 1.4