

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Perturbative approach to open circuit QED systems** ANDY C.Y. LI, Northwestern University, FRANCESCO PETRUCCIONE, University of KwaZulu-Natal and National Institute for Theoretical Physics, JENS KOCH, Northwestern University — Perturbation theory (PT) is a powerful and commonly used tool in the investigation of closed quantum systems. In the context of open quantum systems, PT based on the Markovian quantum master equation is much less developed. The investigation of open systems mostly relies on exact diagonalization of the Liouville superoperator or quantum trajectories. In this approach, the system size is rather limited by current computational capabilities. Analogous to closed-system PT, we develop a PT suitable for open quantum systems. The proposed method is useful in the analytical understanding of open systems as well as in the numerical calculation of system observables, which would otherwise be impractical. This enables us to investigate a variety of open circuit QED systems, including the open Jaynes-Cummings lattice model.

Cheong Yiu Li  
Northwestern Univ

Date submitted: 14 Nov 2013

Electronic form version 1.4