

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Postselected optomechanical superpositions¹ BRIAN PEPPER, UC Santa Barbara, ROOHOLLAH GHOBADI, University of Calgary / Sharif University of Technology, EVAN JEFFREY, University of Leiden, CHRISTOPH SIMON, University of Calgary, DIRK BOUWMEESTER, UC Santa Barbara / University of Leiden — We present a scheme for achieving macroscopic quantum superpositions in weakly coupled optomechanical systems by using single photon postselection. This method allows the creation of macroscopic superpositions with currently achievable device parameters, and allows observation of decoherence on a timescale unconstrained by the system's optical decay time. This method relieves many of the challenges associated with previous optical schemes for measuring macroscopic superpositions, and only requires the devices to be in the weak coupling regime. Prospects for observing novel decoherence mechanisms are also discussed.

¹The authors gratefully acknowledge support from NSF PHY-0804177 and Marie Curie EXT-CT-2006-042580

Brian Pepper
UC Santa Barbara

Date submitted: 11 Nov 2011

Electronic form version 1.4