Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Tunneling Times and Studying the Effects of Dissipation DAVID SPIERINGS, RAMON RAMOS, JOSEPH MCGOWAN, AEPHRAIM STEINBERG, University of Toronto — How much time does a tunneling particle spend in the barrier region? An answer to this question may be defined by considering a "weak measurement" in the sense of Aharonov, Albert, and Vaidman. A Larmor clock, which uses a spin degree of freedom to keep time, can implement such a measurement [1] and this experiment has recently been performed in our group. We now consider probing the quantum/classical transition by studying what happens when the Larmor measurement is made "strong" and/or under the influence of strong interactions and engineered dissipation [2, 3]. [1] Steinberg, A. M. Time and history in quantum tunneling. *Superlattices and Microstructures*, *23*(3–4), 823–832. (1998). http://doi.org/10.1006/spmi.1997.0543 [2] Potnis, S., Ramos, R., Maeda, K., Carr, L. D., & Steinberg, A. M. (2017). Interaction-Assisted Quantum Tunneling of a Bose-Einstein Condensate out of a Single Trapping Well. *Physical Review Letters*, *118*(6), 1–5. http://doi.org/10.1103/PhysRevLett.118.060402 [3] Steinberg, A. M. (1999). On energy transfer by detection of a tunneling atom. Korean Physical Society 35 (3), 122. (http://arxiv.org/abs/quant-ph/9904098)

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Date submitted: 01 Feb 2019 Electronic form version 1.4