

Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Estimation of a quantum interaction parameter using weak quantum measurement: theory and experiment¹ MICHAEL GOGGIN, Truman State University, HOLGER HOFMANN, Hiroshima University, MARCELO ALMEIDA, University of Queensland, MARCO BARBIERI, Universite Paris-Sud, Campus Polytechnique — We investigate the metrological limits of the measurement of an interaction parameter based on a weak measurement and post-selection. A strict connection between weak values and the Fisher information of the measurement scheme is established. The resultant theory is applied to an experiment on the polarization of single photons. The experimental results support the theory and provide insight into the statistics of weak measurements.

¹Work supported by the Japanese Society for the Promotion of Science, the ARC Centre of Excellence Discovery Federation Fellow program, IARPA, and the Marie Curie contract PIEF-GA-2009-236345-PROMETEO.

Michael Goggin
Truman State University

Date submitted: 27 Jan 2012

Electronic form version 1.4