

Abstract Submitted  
for the DAMOP15 Meeting of  
The American Physical Society

**Quantum state estimation and feedback control aided by weak measurement reversal**<sup>1</sup> HERMANN UYS, PIETER DU TOIT, National Laser Centre, Council for Scientific and Industrial Research, Pretoria, South Africa, SHAUN BURD, Department of Physics, Colorado University, Boulder, Colorado, USA, THOMAS KONRAD, School of Chemistry and Physics, University of Kwa-Zulu Natal, Durban, South Africa — We investigate state and frequency estimation of an oscillating qubit using weak POVM measurements. By employing a Fourier transform frequency estimator combined with a strategy of unitary reversal of the weak measurements, it is shown that for sufficiently strong measurements these reversals lead to improved frequency estimation. This approach opens new prospects for feedback control of qubit dynamics.

<sup>1</sup>This work was sponsored in part by grants from the South African National Research Foundation (Grant no.86061) and from the United States Airforce Office of Scientific Research (Award no. FA9550-14-1-0151)

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Date submitted: 30 Jan 2015

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