Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Arrow of time for repeated and continuous quantum measurement[1] ANDREW JORDAN, University of Rochester, JUSTIN DRESSEL, Chapman University, AREEYA CHANTASRI, University of Rochester, KATER MURCH, Washington University, St. Louis, ALEXANDER KOROTKOV, University of California, Riverside — We will present theoretical results on the statistical arrow of time for a quantum system being monitored by a sequence of measurements. For a continuous qubit measurement example, we demonstrate that time-reversed evolution is always physically possible, provided that the measurement record is also negated. Despite this restoration of dynamical reversibility, a statistical arrow of time emerges, and may be quantified by the log-likelihood difference between forward and backward propagation hypotheses. We then show that such reversibility is a universal feature of non-projective measurements, with forward or backward Janus measurement sequences that are time-reversed inverses of each other.

[1]John Templeton Foundation, ID 58558, ARO Grants No. W911NF-15-1-0496, No. W911NF-13-1-0402, NSF grant DMR-1506081, and DTSPPT Thailand

Andrew Jordan
University of Rochester

Date submitted: 11 Nov 2016 Electronic form version 1.4