

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Experimental Violation of Two-Party Leggett-Garg Inequalities with Semi-weak Measurements JUSTIN DRESSEL, CURTIS BROADBENT, JOHN HOWELL, ANDREW JORDAN, University of Rochester — We generalize the derivation of Leggett-Garg inequalities to systematically treat a larger class of experimental situations by allowing multi-particle correlations, invasive detection, and ambiguous detector results. Furthermore, we show how many such inequalities may be tested simultaneously with a single setup. As a proof of principle, we violate several such two-particle inequalities with data obtained from a polarization-entangled biphoton state and a semi-weak polarization measurement based on Fresnel reflection. We also point out a non-trivial connection between specific two-party Leggett-Garg inequality violations and convex sums of strange weak values.

Justin Dressel
University of Rochester

Date submitted: 18 Nov 2010

Electronic form version 1.4