Abstract Submitted
for the APR13 Meeting of
The American Physical Society

A Practical, Straightforward Experiment to Obtain Distinct Overall Which Way and Non-Which Way Distributions at a Distance Using Delayed Choice DOUGLAS SNYDER, None — The proposed experiment relies on a delayed choice whether or not to keep the entanglement between paired signal and idler photons where the idler photon provides which way information to a distant signal photon. One can produce an overall distribution of the signal photons showing interference by losing the idler photons in many other similar photons over many experimental runs or instead an overall which way distribution for the signal photons at a distance by not losing their paired idler photons over many experimental runs. The idler photon is either detected or lost before the entangled signal photon is detected. The overall which way or non which way distributions (the latter exhibiting interference) for the signal photons are not dependent on correlating measurement results on the paired signal and idler photons. Ultrafast switches (such as that of Hall, Altepeter, and Kumar, http://iopscience.iop.org/1367-2630/13/10/105004/fulltext/) can be used to change the paths for the idler photon while the idler photon is in flight. Optical microcavities filled with photons similar to the idler photon can be used to lose the idler photon. The method underlying the experiment is described. One reference to the delayed choice method proposed here is: http://meetings.aps.org/link/BAPS.2012.MAR.K1.303.

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None

Date submitted: 11 Jan 2013 Electronic form version 1.4