

Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Large Fixed Objects, Such as Fixed Mirrors, Impacted by Photons Do Not Provide Which-Way Information Due to Momentum Transfer: Implications for A Delayed Choice Experiment to Send Information Immediately Between 2 Paired Particles DOUGLAS SNYDER, None —

If a photon impacts a much larger fixed object, the momentum transfer from the photon to the fixed object is essentially undetectable. This principle is the basis for a Mach Zehnder interferometer where fixed full-silvered and half-silvered mirrors do not provide which way information when impacted by an incoming photon. Kim relied on fixed mirrors impacted by photons to demonstrate quantum erasure. If the principle did not work, Kim would not have obtained symmetric and anti-symmetric interference. The present experiment relies on delayed choices for idler photons which initially possess ww information that immediately affect the distribution of signal photons initially entangled with the idler photons and for which the idler photons provide ww information. It relies on the principle noted. In the case of the present experiment, one of those fixed objects is an optical microcavity that is situated at the crossroads of two possible paths for the idler photon. The delayed choice concerns whether to maintain or eliminate the entanglement before any measurements are made. If the idler photon enters the microcavity filled with photons in the same mode as the idler photon, the entanglement is eliminated. The resulting distribution of the paired signal photons with this choice shows interference. If the choice is not to send the idler photon toward the microcavity and preserve the which-way information of the idler photons, the resulting distribution of the paired signal photons shows ww information.

Douglas Snyder
None

Date submitted: 16 Dec 2014

Electronic form version 1.4