Erratum

Experimental Results of Aspect et al. Confirm Local Causality [Phys. Essays **7**, 240 (1994)]

Prof. Caroline H. Thompson of the University of Wales has brought to my attention an error by a factor of 2 in my expression for the classically expected relative coincidence counts for the experiment of Aspect et al. Thus, Eq. (5) of my paper should read

$$\left[\frac{\langle R(12)\rangle_{\alpha}}{R_0}\right](\text{classical}) = \frac{1}{8} + \frac{1}{4}\cos^2\phi, \qquad (1)$$

where ϕ is the angle between the polarizers receiving light from the source in opposite directions. This classical result (1) is to be compared with the traditional quantum theoretical expression claimed to have been confirmed by Aspect et al., namely

$$\left[\frac{R(12)}{R_0}\right](\text{traditional quantum theory}) = \frac{1}{2}\cos^2\phi. \qquad (2)$$

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In order to observe two cascade photons from the same atom, as required for (2), the photo-detectors used would have had to be essentially 100% efficient, detecting each and every photon incident on the detector. Since photo-detectors in the wavelength range of interest generally require about 200 photons to produce one count, Aspect et al. could have only detected the classical result (1) and not the claimed result (2). The false claims of Aspect et al. apparently arise from 1) a low photon flux, giving rise to a large random or experimental error, and 2) the subtraction of coincident counts incorrectly claimed to be "accidental." For example, without supplying sufficient specific information, Aspect et al. says there could typically be 600 coincidences to every 200 "true" coincidences. Thus, subtracting such unwarranted "accidentals" from R_0, with no polarizers, could thereby convert the 1/4 coefficient of $\cos^2\phi$ in (1) to their coefficient of 1/2 in (2). The small constant 1/8 term in (1) was apparently neglected after subtracting unwarranted "accidentals" from $\langle R(12)\rangle_{\alpha}$.

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