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**Two-photon interference with two (and only two) independent photons**<sup>1</sup> FRANK KING, College of Wooster, MARGARET TRIAS<sup>2</sup>, Mount Holyoke College, MARTIN LIGARE, Bucknell University — It is well known that intensity correlation functions can reveal multi-photon quantum interference effects. The simplest treatments of such effects are restricted to single-mode fields and fields with stationary photon statistics. In contrast to these treatments we study a simple model in which two photons are spontaneously emitted by two spatially separated atoms. We track the properties of the two-photon field as a function of space and time, and during the time in which the photons overlap the intensity correlation function exhibits interference. The detailed features of the interference could be observed in experiments with heralded single photons. Considering the space and time dependence of correlations for fields in which there are only two independent photons highlights the distinction between interference in correlations of quantized fields and interference in correlations of analogous classical fields.

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