

Abstract Submitted  
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**Spooky Phenomena in Two-Photon Processes** MING-CHIANG LI

— A spooky phenomenon in two-photon coherent atomic absorption was discussed in 1980 [M. C. Li, *Phys. Rev. A* **22** (1980) 1323]. The absorption was initiated by two different laser sources. Classically, it is impossible for atoms to transit coherently in the absorption process, but quantum mechanically it is. This is one of the spooky phenomena in quantum mechanics. Around 1990, there were very active experimental pursuits on a spooky phenomenon of two photons emitted from crystal parametric down conversion. The two-photon coherent atomic absorption process contained all basic ingredients as that in crystal parametric down conversion. However, the former arises from two different laser sources. The atom entangles two photons together and becomes a correlator. The latter arises from a single laser source and two photons are entangled with each other at emission. These two spooky phenomena have been considered as disjointed. The present talk will review two spooky phenomena, and point out their similarities. The investigation on quantum spooky phenomena has led to quantum computing and quantum encryption. It is a hope that the present will stimulate the interest on bring in these two disjointed phenomena together and provide clues in advancing quantum computing and quantum encryption.

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