

Schemes to Generate Entangled Photon Pairs Via Spontaneous Parametric Down Conversion

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Spontaneous parametric down-conversion (SPDC) has been used to generate photon pairs entangled in various parameters. Polarization-entangled photon pairs have been utilized for quantum information experiments, like quantum teleportation and quantum key distribution.

Generally, the polarization-entangled photon pairs are generated by using a type-II BBO crystal, which generates a horizontally polarized photon and a vertically polarized photon as a pair. The photon pairs are polarization entangled only at crossing points of the light cones; therefore the polarization-entangled photon pairs could be obtained by using a spatial filter to block other photons resulting in a large loss.

In this work, we experimentally demonstrated a scheme to generate beamlike photon pairs for two-photon interference and polarization entanglement. This scheme does not require any spatial filter. I will also introduce our related works which have generated photon pairs entangled in their polarization and frequency.