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Arbitrary four-photon cluster state concentration with cross-Kerr nonlinearity.


Summary: We describe an entanglement concentration protocol (ECP) for arbitrary four-photon less-entangled cluster state. The ECP works with the help of quantum nondemolition (QND) measurement and conventional photon detectors. In our ECP, an arbitrary less-entangled four-photon cluster state can be concentrated in two steps. Moreover, in both concentration steps, the discarded states can be reused to obtain a higher success probability. This protocol may be useful in current one-way quantum computation.

Keywords: entanglement concentration; cluster state; cross-Kerr nonlinearity

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