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【102】 Generation of entangled photon pairs via the cross Feshbach resonance

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Generation of entangled photons in semiconductor microcavities through lower and upper polariton scattering via biexciton state was theoretically predicted. However, the ideal condition for its implementation has not yet been experimentally established. A groundbreaking demonstration of a polaritonic Feshbach resonance was realized when the energy of two lower polaritons with anti-parallel spins was tuned in resonance with the biexciton state. Here, we report on the existence of a “cross” Feshbach resonance, for which the lower and upper polariton scatter efficiently to the biexciton state. The spectral width of the cross-Feshbach resonance is an important quantity that determines the rate at which the biexciton decays radiatively generating a pair of polarization and momentum entangled photons in the lower polariton branch.

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