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[501] Temporal control of polarization entanglement in semiconductor waveguides

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We create polarization entangled, spectrally broadband photon pairs from parametric down-conversion in semiconductor Bragg-reflection waveguides. We show, how to adjust the coherence of the polarization entangled states by controlling the relative temporal delay between a pair of photons with a birefringent retarder. Otherwise, the slight temporal walk-off of the photon pair, which is caused by the highly dispersive waveguide, results in an uncompensated phase. Our experimental and theoretical results show, how the state characteristics can be tuned directly at the source, offering a simple way to optimize the degree of entanglement.

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