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**Sideband eraser of “which-path” information for entangled photons on demand** BILL COISH, JAY GAMBETTA, Institute for Quantum Computing and Department of Physics and Astronomy, University of Waterloo — The biexciton cascade in a quantum dot can be used to generate entangled-photon pairs rapidly and deterministically (on demand). However, due to a large fine-structure splitting between intermediate exciton energy levels, which-path information encoded in the frequencies of emitted photon pairs leads to a small degree of entanglement. Here we show that this information can be efficiently erased by modulating the exciton and biexciton energy levels [1], giving rise to new decay paths through additional sidebands. The resulting degree of entanglement is substantial, and can be made maximal through spectral filtering, with only a nominal reduction in collection efficiency.

[1] W. A. Coish and J. M. Gambetta, arXiv:0907.0437

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