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Demonstration of Backward-wave Parametric Down-Conversion CHIH-SUNG CHUU, CHUN-YAO YANG, JIM LIN, Department of Physics and Frontier Research Center on Fundamental and Applied Sciences of Matters, National Tsing Hua University, Taiwan, CHARLOTTE LILJESTRAND, CARLOTA CANALIAS, KTH - Royal Institute of Technology, Sweden, STEPHEN HARRIS, Edward L. Ginzton Laboratory, Stanford University, USA — Ultrabright sources of temporally long and spectrally narrow photons are essential for efficient light-matter interaction at the single-photon level. To achieve high brightness, parametric down-conversion of the backward-wave type was proposed for single-mode generation of long biphotons [1]. In this talk I will describe the demonstration of backward-wave parametric down-conversion in a nonlinear crystal, of which the time-energy entanglement was characterized by the Franson interference. I will also discuss the possibility of realizing a miniature ultrabright biphoton source.

[1] C.-S. Chuu and S. E. Harris, Phys. Rev. A 83, 061803(R) (2011)

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