

Abstract Submitted  
for the DAMOP19 Meeting of  
The American Physical Society

**Demonstration of narrowband biphotons with sub-MHz bandwidth from low-optical-depth atomic ensemble** RAVIKUMAR CHINNARASU, YI-FENG DING, CHI-YANG LIU, CHIH-SUNG CHUU, National Tsing Hua University — Biphotons of narrow bandwidth and long temporal length have potential applications in realizing efficient light-matter interface and quantum communication. However, generation of these photons usually requires atomic ensembles with high optical depth or spontaneous parametric down-conversion with delicate optical cavities. We propose and demonstrate narrowband biphotons with sub-MHz bandwidth using detuned four-wave mixing in low-optical-depth atomic ensemble. The bandwidth of the biphotons is only limited by the ground-state decoherence rate. We also demonstrate the potential of shaping these photons.

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Date submitted: 31 Jan 2019

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