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Workshop or Conference

Jeudi 19 Juillet 2018, 13 :45
LKB, LKB, 240, tour 13-23 2e Jussieu
Domaines : quant-ph

Titre : *High-efficiency broadband single-photon frequency upconversion*

Orateur : **E Wu (East China Normal University, Shanghai)**

Résumé : *Nowadays, single-photon frequency upconversion detectors (UCDs) have recently drawn a great deal of attention because it can be utilized as a quantum interface that enable qubits to transfer from infrared to visible regime, while preserving the quantum state information and then use Si-APDs to count the visible sum-frequency replicas of the infrared photons with high detection efficiency, high signal-to-noise ratio, short dead time, low timing jitter. The UCDs are increasingly used in more fields of importance, such as quantum key distribution (QKD), quantum metrology, quantum computation and quantum tomography. However, when pulse duration of the signal photons are very short to femtosecond where the spectrum of signal photons is very broadband to fulfill the Fourier transformation, the conversion efficiency will be much decreased, because the spectral width from these source is much wider than the acceptance bandwidth of the PPLN waveguide (0.2 nm). Here, we demonstrated a high efficiency telecom wavelength broadband single-photon frequency upconversion in PPLN crystal. By optimizing the pump light spectral bandwidth, we got 19.54*