# Controlling two-photon interferences in hot atomic vapor to construct a single-photon source at telecom wavelengths

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The generation of quantum light with tailored photon statistics is a key requirement of novel quantum technologies ranging from quantum information protocols to advanced microscopy systems. Our aim is to realize such a quantum light source by precisely controlling the two-photon interference between the coherent light from a weak laser and the collectively enhanced non-linearly scattered light by an atomic ensemble [1]. We demonstrated this two-photon interference effect in a proof-of-principle experiment with an ensemble of trapped cold Cesium atoms coupled to a nanofiber-waveguide. By controlling the amplitude and phase of both light fields, we engineer the quantum statistics of the light transmitted through the atomic ensemble from bunching to anti-bunching [2,3]. Now, we transferring this concept to a hot atomic vapor cell of $^{87}$Rb atoms. To circumvent detrimental effects due to Doppler broadening, we are using a two-photon transition in a three-level ladder system for the two-photon interference process. This should allow for the generation of Fourier-limited single photons from a compact room-temperature source in the telecom C-Band at 1529 nm.

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