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【511】A Broadband Rb Vapor Cell Quantum Memory for Single Photons

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Quantum memories are an essential ingredient for quantum repeaters. Further, through synchronization they can facilitate the generation of multiphoton states. This enables scaling optical quantum information processing experiments into a regime beyond the realm of classical simulation. We implemented a broadband optical quantum memory with on-demand storage and retrieval in hot Rb vapor. Operating on the Rb D_1 line, this memory is suited for storing single photons emitted by GaAs droplet quantum dots or by spontaneous parametric down conversion (SPDC) sources. We demonstrate storage of true single photons with a bandwidth of 200 MHz, generated by a SPDC source with 50% heralding efficiency, and show non-classical $g^{(2)} < 1$ of the photons read out of the memory.

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