



Contribution ID : 117

Type : **Poster**

Using Four-Wave Mixing in Thermal Vapours as a single photon source

Saturday, 26 November 2022 16:00 (120)

Single photon sources are highly sought after because photons are excellent quantum information carriers, and are important for quantum communication and fundamental quantum optics. We use a ladder energy level system on the $5S_{1/2}$ - $5P_{3/2}$ - $5D_{3/2}$ states of thermal ^{87}Rb vapour to produce a heralded single photon source with a heralded auto-correlation value of $g^2(\tau = 0) = 0.22 \pm 0.2$ which is non-classical. We also place the vapour in a 0.6 Tesla magnetic field to implement this scheme in the hyperfine Paschen-Back regime, where the transitions are separated by more than their linewidth, which allows for a cleaner system.

Category

Other

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Session Classification : Poster session

Track Classification : Physics Posters