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# (G*) (POS-51) Deployable quantum memory systems in optical communications

*Tuesday 28 May 2024 17:51 (2 minutes)*

A quantum internet of connected nodes requires the ability to send single photons across vast distances, something not possible with current fiber optic technology. A solution to this is the utilization of quantum repeater nodes which are reliant on a trustworthy quantum memory (QM) device. We will present a deployable quantum memory system that utilizes Electromagnetically Induced Transparency for optical storage in a warm atomic vapour. We have characterized the storage lifetime, signal to noise ratio (SNR) and bit error rate (BER) of the D1 transition manifold of isotopically pure Rb87.
Using optical pulses of 500ns duration, we obtained a storage lifetime of 175us. These lifetimes highlight the potential of our portable quantum memory system for long distance quantum communication schemes. Further, our QM system has a dual rail configuration that allows the storage of arbitrary polarization qubits. The dual rail system allows us to quantify SNR of two spatially distinct channels and to characterize the memory performance for on-off keying through use of polarization differential.
Our poster will provide an overview of this novel system and highlight the capability of deployable QM systems in long distance communications and the possible future applications.

## Keyword-1

Quantum Communication

## Keyword-2

EIT

## Keyword-3

Rubidium 87

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