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Contribution ID: 4402 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Comparison of coherent storage and light generation in cold vs thermal atomic ensembles.

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We compare the results of Electromagnetically Induced Transparency (EIT) and Four-Wave Mixing (4WM) in both thermal Rubidium vapor and cold atom-based systems. Our aim is to balance simplicity and fidelity in systems that aim to produce atom-resonant quantum states of light. We discuss the construction of a Magneto Optical Trap (MOT) on an extremely low budget and discuss strategies for implementing a cold atom system with limited resources. In our next steps, we plan to employ a cavity-enhanced 4WM system with minimal optical power to generate squeezed quantum states. In order to achieve the required phase stability between the involved fields, we have tested both electronic phase-lock systems and a sideband approach using an Electro-optical modulator. In the proposed work, a cavity is locked to a laser which in turn is locked to an atomic ensemble, enabling strong photon-atom interactions.

Keyword-1

Squeezed light

Keyword-2

Cold Atoms

Keyword-3

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