

Abstract Submitted
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Frequency Characteristics of Parametric Four-Wave Mixing ERIK BREKKE, SAM POTIER, St. Norbert College — We have investigated the frequency characteristics of the coherent 420 nm beam generated via parametric four-wave mixing. A single, high-power 778 nm laser is directed through a high-density rubidium cell with a detuning of 1 THz from the intermediate state, generating fields at 420 nm and 5.23 μm through four-wave mixing. The frequency of the 420 nm light has been found to shift as the excitation laser is tuned, with a measured frequency shift ratio of 1.87 corresponding with the selection of a different velocity class at each excitation frequency. The 420 nm light has been tuned over a range of 1 GHz. Further investigation is underway to increase the efficiency of the process using optical pumping and a build-up cavity. This parametric four-wave mixing process has potential application as a tunable photon source at novel wavelengths.

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