

Abstract Submitted
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Optical cavity for enhanced parametric four-wave mixing in rubidium ERIK BREKKE, SAM POTIER, St. Norbert College — We have incorporated a ring cavity to enhance the efficiency of parametric four-wave mixing in rubidium. Using an input coupler with 95 percent reflectance, a finesse of 19.6 is achieved with a rubidium cell inside. This increases the circulating intensity by a factor of 5.6, and through two-photon excitation on the $5s_{1/2}$ to $5d_{5/2}$ transition with a single excitation laser, up to 1.9 mW of power at 420 nm is generated, 50 times what was previously generated with this scheme and comparable to low power two-step excitation. The dependence of the output on Rb density and input power has been explored, suggesting the process may be approaching saturation. The blue output of the cavity also shows greatly improved spatial quality, combining to make this a promising source of 420 nm light for future experiments.

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