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**Saturation and alternate pathways in four-wave mixing in rubidium** ERIK BREKKE, NOAH SWAN, St. Norbert College — We have examined the frequency spectrum of the blue light generated via four-wave mixing in a rubidium vapor cell inside a ring cavity. At high atomic density and input laser power, two distinct frequency components separated by 116 MHz are observed, indicating alternate four-wave mixing channels through the $6p_{3/2}$ hyperfine states. The dependence of the generated light on excitation intensity and atomic density are explored, and indicate the primary process has saturated. This saturation results when the excitation rate through the 6p state becomes equal to the rate through the 5p state, giving no further gain with atomic density while a quadratic intensity dependence remains. The four-wave mixing process remains a promising source of 420 nm light with careful selection of the excitation parameters.

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