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Measurement of the Fine Structure Mixing Cross-Section for Rubidium in the Presence of Helium Buffer Gas BRIAN PATTERSON, GREGORY JEMO, RYAN MEETER, JERRY SELL, RANDY KNIZE, United States Air Force Academy — We report measurements of the cross-section for collisional excitation transfer between the $^5P_{1/2}$ and $^5P_{3/2}$ states of rubidium in the presence of a helium buffer gas for a range of helium pressures. The measurements were carried out using selected femtosecond pulses from a mode-locked Ti:Sapphire laser tuned to the D2 transition of rubidium. Fluorescence from both the D1 and D2 transitions was detected using time-correlated single photon counting. The $^5P_{3/2} \rightarrow ^5P_{1/2}$ mixing cross section was determined by fitting the fluorescence data to the analytic solutions of the rate equations for a three-level system. The measurements were repeated using pump light tuned to the D1 transition of rubidium and for helium pressures of 1, 2, and 3 atm.

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