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**Rubidium $5P$ fine-structure mixing due to three-body collisions in dense $^4$He gas** JERRY SELL, ROBERT LLOYD, JONATHAN PLYLER, BRIAN PATTERSON, RANDY KNIZE, United States Air Force Academy, ALINA GEARBA, University of Southern Mississippi — We will report on the enhancement of Rb fine-structure transfer in helium buffer gas due to three-body collisions which occur at dense ($\geq$ 1 atm) He pressures. Previously we measured the three-body fine-structure transfer rate for a room temperature Rb-He mixture. Additional measurements have been made to examine the temperature dependence of this effect. The fine-structure transfer rates are measured by detecting the emitted fluorescence from collisional excitation transfer using time-correlated single-photon counting, with the fluorescence curves fitted to the solutions of the rate equations for a three-level atomic system. The Rb-He mixture is varied in temperature from 25-200 C and the $^4$He pressure is varied from 50-3000 Torr.

Jerry Sell
United States Air Force Academy

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