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Enhancement of Rb fine-structure transfer in He and Ar due to three-body collisions JERRY SELL, BRIAN PATTERSON, TIM GENDA, BEN NAUMANN, RANDY KNIZE, U.S. Air Force Academy, ALINA GEARBA, University of Southern Mississippi — Using ultrafast laser excitation and time-correlated single- photon counting techniques we have measured the collisional mixing rates between the rubidium 5^2P fine-structure levels in the presence of He and Ar inert gases. The mixing rates and collisional cross sections are determined from the time-dependence of the fluorescence observed from collisional transfer. A nonlinear dependence of the mixing rate with ^{4}He density is observed. This nonlinearity corresponds to Rb fine-structure transfer primarily due to binary collisions with ^{4}He at densities of $\leq 10^{19}$ cm^{-3}, while at greater densities three-body collisions become significant. These interactions can be between bound, quasibound, and free atoms which we discuss. Recent measurements of Rb-Ar fine- structure transfer will also be presented.

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