

Abstract Submitted
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Temperature Dependence of Rb 5P Fine-Structure Transfer Induced by ^4He Collisions¹ M.A. GEARBA, University of Southern Mississippi, J.F. SELL, B.M. PATTERSON, R. LLOYD, J. PLYLER, R.J. KNIZE, US Air Force Academy — Employing ultrafast laser excitation and time-correlated single-photon counting, we have measured the fine-structure transfer between Rb 5P states induced by collisions with ^4He buffer gas at temperatures up to 150°C. The temperature dependence of the binary cross-section agrees with earlier measurements while having almost an order of magnitude smaller uncertainty. Our data show that the temperature dependence of the three-body rate is about the same as that of the binary rate. The three-body rate can be described as arising from the reduction of the rubidium fine-structure splitting due to nearby helium atoms. Our fine-structure transfer studies are relevant for understanding alkali-inert gas atomic interactions as well as for practical applications in alkali laser development.

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