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Photoassociative spectroscopy at long range in ultracold strontium P.G. MICKELSON, S.B. NAGEL, A.D. SAENZ, Y.N. MARTINEZ, Rice University, Y.C. CHEN, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan, T.C. KILLIAN, Rice University, P. PELLEGRINI, R. CÔTÉ, University of Connecticut — We discuss photoassociative spectroscopy of Strontium in a magneto-optical trap operating on the $^1S_0$ –> $^3P_1$ intercombination line at 689 nm. A laser detuned from the 461 nm atomic resonance by hundreds of MHz to a few GHz drives the photoassociative transitions. The photoassociation occurs at long range, and relativistic retardation strongly influences the photoassociative spectrum. The results resolve differences between experiment and recent theoretical calculations for the $^1P_1$ atomic lifetime.

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