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Excited-state spectroscopy for producing ultracold ground-state NaRb molecule[1] DAJUN WANG, BING ZHU, MINGYANG GUO, XIAOKE LI, BO LU, FUDONG WANG, XIN YE, Department of Physics, the Chinese University of Hong Kong, ROMAIN VEXIAU, ELIANE LUC, NADIA BOULOUFA-MAAFA, OLIVIER DULIEU, Laboratoire Aimé Cotton, CNRS/ Univ. Paris-Sud/ ENS Cachan, Orsay, France — We report a joint experimental and theoretical investigation on the excited states of NaRb molecule. In particular, we focus on the $A^1\Sigma^+/b^3\Pi$ admixture which is a promising intermediate state for transferring weakly-bound NaRb Feshbach molecules to the $v = 0$ level of the $X^1\Sigma^+$ state. Based on RKR potentials obtained from conventional molecular spectroscopy [1], we identified several levels which satisfy the requirements for efficient two-photon population transfer. Starting from a pure sample of NaRb Feshbach molecules, we have experimentally observed most of these levels. The detailed characterization of these levels, including their transition strengths and singlet/triplet mixing ratios, as well as searching of the $v = 0$ level of the $X^1\Sigma^+$ state with two-photon Autler-Townes spectroscopy, are well underway.

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