

Abstract Submitted  
for the DAMOP17 Meeting of  
The American Physical Society

**Continuous Production of Rovibronic Ground State RbCs Molecules via Short-Range Photoassociation to the  $B^1\Pi$ ,  $c^3\Sigma^+$ , and  $b^3\Pi$  states** TOSHIHIKO SHIMASAKI, Dept. of Physics, Yale Univ., USA, JIN-TAE KIM, Dept. of Photonic Eng., Chosun Univ., Korea, YUQI ZHU, DAVID DEMILLE, Dept. of Physics, Yale Univ., USA — Electronic states with strong singlet-triplet mixing can be useful for efficient direct molecule production in the rovibronic ground state via short-range photoassociation (PA). We have observed rovibronic levels of the strongly mixed  $B^1\Pi(\Omega = 1)$ ,  $c^3\Sigma^+(\Omega = 0^- \text{ and } 1)$ , and  $b^3\Pi(\Omega = 0^-, 0^+, \text{ and } 1)$  states of  $^{85}\text{Rb}^{133}\text{Cs}$  in the energy range of 13950 -14200  $\text{cm}^{-1}$  using short-range PA. For selected PA states, vibrational branching and rotational branching in the  $X^1\Sigma^+(v = 0)$  state have been investigated using resonance-enhanced multiphoton ionization and depletion spectroscopy [1], respectively. Efficient production of the rovibronic ground state  $X^1\Sigma^+(v = 0, J = 0)$  has been observed for some of the PA states in this energy range. Molecule production rate up to  $\sim 1 \times 10^4$  molecules/s into the rovibronic ground state has been achieved, which is a factor of 5 improvement compared to previously observed PA states [2]. [1] T. Shimasaki *et al.*, Phys. Rev. A **91**, 21401 (2015). [2] T. Shimasaki *et al.*, ChemPhysChem **17**, 3677 (2016).

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Date submitted: 29 Jan 2017

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