

Abstract Submitted  
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**Toward Trapped Ultracold RbCs Molecules in the Absolute Ground State** MATTIAS GUSTAVSSON, COLIN BRUZEWICZ, ALPHA GAËTAN, NATHAN GILFOY, STEPHAN FALKE, TOSHIHIKO SHIMASAKI, DAVID DEMILLE, Yale University — We report on an improved apparatus for production of ultracold, optically trapped RbCs molecules, aiming to achieve an ultracold sample of polar molecules in the rovibrational ground state. Starting with a spin-polarized sample of Rb and Cs atoms, molecules are formed by photoassociation and decay into high vibrational levels of the triplet ground state. We plan to transfer these molecules to the absolute ground state via an electronically excited state of mixed singlet and triplet character, as previously demonstrated in our lab with pulsed lasers. Currently, we are working on high resolution spectroscopy of this state using cw diode lasers, to identify a suitable level for a subsequent STIRAP transfer to the ground state with control over rotational and hyperfine structure. We will present our latest results, and will also report on efforts to directly image a molecular sample with resolution by photoionization and subsequent detection on a phosphor screen behind a microchannel plate.

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