

Abstract Submitted
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Short-range photoassociation of LiRb¹ DAVID BLASING, IAN STEVENSON, Purdue University, JESS PREZ-ROS, None, DANIEL ELLIOTT, YONG CHEN, Purdue University — We have observed short-range photoassociation of ⁷Li⁸⁵Rb to the two lowest vibrational states of the $d^3\Pi$ potential. We have also observed several $a^3\Sigma^+$ vibrational levels with generation rates between $\sim 10^2$ and $\sim 10^3$ molecules per second, resulting from the spontaneous decay of these $d^3\Pi$ molecules. This is the first observation of many of these $a^3\Sigma^+$ levels. We observe an alternation of the peak heights in the rotational photoassociation spectrum that depends on the parity of the excited molecular state. Franck-Condon overlap calculations predict that photoassociation to higher vibrational levels of the $d^3\Pi$, in particular the sixth vibrational level, should populate the lowest vibrational level of the $a^3\Sigma^+$ state with a rate as high as 10^4 molecules per second. This work also motivates an experimental search for short-range photoassociation to other bound molecules, such as the $c^3\Sigma^+$ or $b^3\Pi$, as prospects for preparing ground-state molecules.

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