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The $C\ ^1\Sigma^+$, $A\ ^1\Sigma^+$, and $b\ ^3\Pi_{0^+}$ states of LiRb IAN STEVENSON, DAVID BLASING, YONG CHEN, DANIEL ELLIOTT, Purdue University — We present the first spectroscopic studies of the $C\ ^1\Sigma^+$ electronic state and the $A\ ^1\Sigma^+$ - $b\ ^3\Pi_{0^+}$ complex in ^{7}Li - ^{85}Rb. Using resonantly-enhanced, two-photon ionization, we observed $v = 7$, 9, 12, 13 and $26 - 45$ of the $C\ ^1\Sigma^+$ state. We augment the REMPI data with a form of depletion spectra in regions of dense spectral lines. The $A\ ^1\Sigma^+$ - $b\ ^3\Pi_{0^+}$ complex was observed with depletion spectroscopy, depleting to vibrational levels $v = 0 \rightarrow 29$ of the $A\ ^1\Sigma^+$ state and $v = 8 \rightarrow 18$ of the $b\ ^3\Pi_{0^+}$ state. For all three series, we determine the term energy and vibrational constants. Finally, we outline several possible future projects in ultracold molecules based on the data presented here.

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