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**New Data and Analysis of Available Data on the $A^1\Sigma_u^+$
and $b^3\Pi_{0u^+}$ States of Rb_2** ¹ T. BERGEMAN, H. SALAMI, SUNY
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KOTOCHIGOVA, Temple U., C. LISDAT, U. Hannover, Germany, O.
DULIEU, Lab. Aime Cotton, U. Paris-Sud, Orsay, France — The lowest
excited states of alkali dimers are of interest as intermediaries in the
excitation of higher levels and in the production of ultracold ground
state molecules. With help of new data, particularly on low vibrational
levels of the A state, and improved *ab initio* estimates of potentials and
spin-orbit functions, we have produced an improved fit to available data
on the A and b states of Rb_2 . Currently, the rms residual of our fit
is 0.22 cm^{-1} , as compared with experimental uncertainties of 0.003 to
 0.008 cm^{-1} . This suggests that the primary structures are reproduced
in the model, but there remains some deficiency, perhaps in the form of
the spin-orbit coupling function, or associated with insufficient data on
the $b^3\Pi_{0u^+}$ state.

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