**Bound-free Emission in the NaK Molecule**[1] B.M. MCGEEHAN, S.
ASHMAN, S.J. SWEENEY, C.M. WOLFE, J.P. HUENNEKENS, A.P. HICKMAN,
Lehigh University — We are extending the analysis of the bound-free emission from
the $4\,^3\Sigma^+$ electronic state to the $a(1)\,^3\Sigma^+$ repulsive state of the NaK molecule. In
previous work, Burns *et al.* [J. Chem. Phys. **119** 4743–4754 (2003)] measured
spectra from initial vibrational levels up to $v = 8$, determined a refined potential
for the $4\,^3\Sigma^+$ state, and obtained relative values of the transition dipole moment
function $M(R)$ in the range $R \sim 3.8$ Å to 4.6 Å. Recent measurements include data
for many additional vibrational levels up to $v = 34$ of the $4\,^3\Sigma^+$ state. The new data
provide information about $M(R)$ for larger values of $R$, including a region where
theoretical calculations have predicted sharp structure due to an avoided crossing.
Using a version of R. J. Le Roy's code BCONT that we modified, we will obtain
values $M(R)$ for a larger range of $R$, and we will refine the inner repulsive wall of
the potential for the $a(1)\,^3\Sigma^+$ state.

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