Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Global analysis of data on the $A\ ^1\Sigma^+ \sim b\ ^3\Pi$ states of NaK[1] HOUSSAM SALAMI, THOMAS BERGEMAN, SUNY Stony Brook, AMANDA ROSS, U. Lyon 1 — NaK electronic states have been extensively studied over recent years. Many of these studies have involved the lowest excited states, $A\ ^1\Sigma^+$ and $b\ ^3\Pi$, as they offer pathways to higher states. These states have regained attention as they are used as intermediaries in the production of ultracold molecules. Recently, the $b\ ^3\Pi_0 \sim A\ ^1\Sigma^+$ spin-orbit interactions have been examined [1,2]. However analysis was based on band-by-band local deperturbation which is not consistent with experimental errors limits. In this study, we collect existing (published and unpublished) data from various experiments (FT-LIF, PLS and PFOODR) performed at Orsay and Lyon (Ross et al.), Warsaw (Kowalczyk et al.) and Lehigh (Huennekens et al.) universities. Transitions from $D\ ^1\Pi$, $B\ ^1\Pi$, and $C\ ^1\Sigma^+$ states simultaneously to the $A \sim b$ and X states constitute the bulk of the data as the upper term energy values can be deduced precisely from the well known X state parameters. Combined data will be modeled using a global deperturbation approach employing the discrete variable representation (DVR) so as to fit potential energy and spin-orbit functions.
1. P. Burns et al., J. Chem. Phys. **122**, 074306 (2005).
2. R. Ferber et al., J. Chem .Phys.**112**, 5740 (2000).

[1]Work at Stony Brook was supported by NSF grant PHY00652459.

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Date submitted: 22 Jan 2009 Electronic form version 1.4