

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

First Observation of the $2^1\Pi$ state of NaH¹ CHIN-CHUN TSAI, Department of Physics, National Cheng-Kung University, Taiwan, HSIEN-YU HUANG, TSAI-LIEN LU, THOU-JEN WHANG, Department of Chemistry, National Cheng-Kung University, Taiwan — The upper levels (to the last bound vibrational level) of NaH $2^1\Pi$ state have been observed for the first time by using pulsed optical-optical double resonance fluorescence depletion spectroscopy. About 20 rovibrational energy levels, $v=2-5$ and $J=1-9$, were assigned to this electronic state by comparing the successive rotational spectra through selected intermediate levels of the $A^1\Sigma^+$ state. A decreased background fluorescence on the recorded spectra near the atomic asymptotic of Na($3d$)+H($1s$) indicates that the dissociation limit of $2^1\Pi$ state is approaching. Compared with the eigenvalues solved from the potential of Aymer's *ab* initial calculations, the vibrational quantum numbers were assigned. Un-observed lower levels ($v=0$ and 1) are due to the lack of Franck-Condon factor under accessible intermediate levels of the $A^1\Sigma^+$ state.

¹We gratefully acknowledge the financial support of this work by the National Science Council, Taiwan.

Chin-Chun Tsai
Department of Physics, National Cheng-Kung University, Taiwan

Date submitted: 08 Nov 2012

Electronic form version 1.4