

Abstract Submitted  
for the DAMOP17 Meeting of  
The American Physical Society

**Wigner time delay in photodetachment of  $\text{Tm}^-$  and in photoionization of Yb: A comparative study.**<sup>1</sup> SOUMYAJIT SAHA, Indian Institute of Technology Madras, JOBIN JOSE, Indian Institute of Technology Patna, PRANAWA DESHMUKH, Indian Institute of Technology Tirupati, VALERIY DOLMATOV, University of North Alabama, ANATOLI KHEIFETS, Australian National University, STEVEN MANSON, Georgia State University — Preliminary studies of Wigner time delay [1] in photodetachment spectra of negative ions have been reported [2]. Photodetachment time delay for some dipole channels of  $\text{Tm}^-$  and of  $\text{Cl}^-$  were calculated using relativistic random phase approximation (RRPA) [3,4]. Comparisons between photodetachment time delay of  $\text{Cl}^-$  and photoionization time delay of Ar were made. We investigate the photodetachment time delay for all three relativistically split  $nd \rightarrow \epsilon f$  channels of  $\text{Tm}^-$  and for  $nd \rightarrow \epsilon f$  channels of Yb (isoelectronic to  $\text{Tm}^-$ ) using RRPA. We study the effect of the shape resonance, brought about by the centrifugal barrier potential [5], on photodetachment time delay. A negative ion is a good laboratory for studying the effects of shape resonances on time delay since the phase is unaffected by the Coulomb component. [1] E. P. Wigner, *Phys. Rev.* **98**, 145 (1955) [2] S. Saha, *et al*, *BAPS* **61**(8), 53 (2016) [3] W. R. Johnson, C. D. Lin, *Phys. Rev. A* **20**, 964 (1979) [4] W. R. Johnson, *et al*, *Phys. Rev. A* **25**, 337 (1982) [5] A. R. P. Rau and U. Fano, *Phys. Rev.* **167**, 7 (1968).

<sup>1</sup>Wigner time delay in photodetachment of  $\text{Tm}^-$  and in photoionization of Yb: A comparative study

Pranawa Deshmukh  
Indian Institute of Technology Tirupati

Date submitted: 02 Feb 2017

Electronic form version 1.4