

Abstract Submitted  
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**Limit on variation of fundamental constants from photoassociation in ultracold gases** MARKO GACESA, ROBIN CÔTÉ, University of Connecticut — We propose a novel approach to measure the limit on the time variation of the electron-to-proton mass ratio  $\beta = m_e/m_p$ . It has been shown that the scattering length, which can be obtained from ultracold scattering experiments, is extremely sensitive to  $\beta$ <sup>1</sup>. We show that the photoassociation (PA) rate of ultracold atoms into molecules can also exhibit such dependence. The PA rate near a Feshbach resonance, which exhibits both a maximum at the resonance and a minimum in vicinity, allows for high sensitivity at both, while near the minimum the saturation effect is negligible. Our prediction based on a two-channel model and numerical solution indicates that the precision measurement of variation of  $\beta$  of up to  $10^{-14} - 10^{-15}$  could be possible in a suitable system.

<sup>1</sup>Cheng Chin and V. V. Flambaum, PRL 96, 230801(2006)

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