Abstract Submitted
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Measurement of isotope shifts in Fe II MARCO ASCOLI, Department of Physics, University of Connecticut, Storrs CT, DAVID KAWALL, Department of Physics, University of Massachusetts at Amherst, MA, EDWARD EYLER, Department of Physics, University of Connecticut, Storrs CT, DAVID DEMILLE, Department of Physics, Yale Univerity, New Haven CT — We describe absorption spectra of singly ionized iron (Fe II) obtained with a compact ion source and a high-resolution UV laser. Using a Nd:YAG laser ablation source and buffer gas cooling with room-temperature argon, Fe II ions are produced in a cold plasma. Grating spectroscopy is used to determine conditions favorable parameters providing good cooling and ion yield. This novel technique allows us to study the Fe II transition $a^6D_9 \rightarrow z^6D_9^o$ with Doppler widths about 3 GHz, by measuring the absorption of a frequency-tripled pulse-amplified cw Ti:Sapphire laser. The isotope shift of this transition is important to the analysis of astronomical data on the cosmological evolution of the fine-structure constant α [1]. We will discus the design of the ion source and laser system, and present preliminary results. This study was funded by the National Science Foundation.

[1] J.K Webb,M.T. Murphy, V.V. Flambaum, V.A. Dzuba, J.D. Barrow, C.W. Churchill, J.X. Prochaska, and A.M. Wolfe, Phys. Rev. Lett. **87**, 091301 (2001).

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