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Efficiency Measurement of Two Photon Excitation of Metastable Xenon DANIEL REINFURT, Department of Physics, United States Air Force Academy, 80840 USAFA, CO, USA, MICHAEL SHAFFER, Shaffer Consulting Inc, JACOB DELANGE, RANDY KNIZE, Department of Physics, United States Air Force Academy, 80840 USAFA, CO, USA — We report on the progress an experiment to characterize the optical generation of metastable xenon with two photon excitation. In order to trap xenon inside a magneto optical trap (MOT), it must first be excited to the metastable state, such that the MOT can utilize the 882 nm cycling transition. We have designed a system to measure the efficiency of two photon excitation in generating metastable Xenon in a collimated atomic beam. Using a retro-reflected 252 nm laser beam, we will optically pump the Xenon, Doppler free, directly from the ^{1}S0 5p^6(0) state to the ^{2}P3/2 6p[3/2]2 excited state, removing the need for an intermediate state. This method offers a potential gain of orders of magnitude in efficiency over both the RF discharge and UV lamp excitation methods. This will be a key step in improving the ability of our MOT system to trap samples of xenon, reducing the demands on our differentially pumped vacuum system. PA: USAFA-DF-2020-332

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