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Search for the atomic EDM of ^{171}Yb in an optical dipole trap
TIAN XIA, TAO ZHENG, YANG YANG, SHAOBO ZHANG, YUKUN FENG, ZHAOFENG WAN, SHAOZHENG WANG, ZHENG-TIAN LU, University of Science and Technology of China, MATTHEW DIETRICH, MICHAEL BISHOF, PETER MUELLER, KEVIN BAILEY, THOMAS O'CONNOR, Argonne National Laboratory, ROY READY, JAIDEEP SINGH, Michigan State University, BAOLONG LV, ZHUAN-XIAN XIONG, Wuhan Institute of Physics and Mathematics, Chinese Academy of Sciences, RA-EDM COLLABORATION — We present a search for the atomic electric dipole moment (EDM) of ^{171}Yb, a stable isotope with the ground state property of L = 0, S = 0, and I = 1/2. ^{171}Yb atoms are captured by a two-stage MOT, transported using a movable optical dipole trap over 65 cm into a science chamber, and transferred to a 1D optical lattice. There, the atoms are allowed to precess under a uniform B field of 10 mG and a strong, reversible E field of 100 kV/cm. The precession frequencies measured under opposite E fields are used to search for the EDM. We describe the progress, challenges, and prospects of the experiment. Through this experiment, we develop atom manipulation techniques and study systematics for a parallel search for the EDM of ^{225}Ra, a radioactive isotope expected to possess a much larger Schiff moment due to its nuclear octupole deformation.

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