Abstract Submitted
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Weak interaction studies with laser-trapped ^{6}He[1] DAVID ZUMWALT, Univ of Washington, YELENA BAGDASAROVA, ALEJANDRO GARCIA, RAN HONG, MATT STERNBERG, DEREK STORM, ERIK SWANSON, FREDERIK WAUTERS, University of Washington, KEVIN BAILEY, ARNAUD LEREDDE, PETER MUELLER, TOM O'CONNOR, Argonne National Laboratory, XAVIER FLECHARD, ETIENNE LIÉNARD, Université de Caen, OSCAR NAVILIAT-CUNCIC, Michigan State University — ^{6}He beta decay is an excellent case to test the nature of the weak interaction through a precise measurement of the $\beta - \overline{\nu}$ angular correlation parameter a. The pure Gamow-Teller decay of ^{6}He should be ruled by an axial-vector interaction only, which leads to $a = -1/3$. Any deviation due to tensor coupling contributions would indicate new physics beyond the Standard Model. The high precision goal of this experiment, $\Delta a/a = 0.1\%$, requires a large statistical sample along with small and well known systematic uncertainties. To satisfy these constraints, neutral ^{6}He atoms are captured with laser light in a magneto-optical trap (MOT). ^{6}He ($t_{1/2} = 807$ ms) is produced on-line through the ^{7}Li(d,^{3}He)^{6}He nuclear reaction by impinging a molten lithium target with an intense 18 MeV deuteron beam. Up to 10^{10} ^{6}He atoms per second are extracted from the target and trapped in a two stage MOT. The angular correlation parameter is obtained by detecting the ^{6}Li+ recoil ions in coincidence with the beta particle. Details of the setup and first results will be presented.

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