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Measuring β-ν angular correlation with laser trapped ^{6}He ARNAUD LEREDDE, KEVIN BAILEY, PETER MUELLER, THOMAS O'CONNOR, Argonne National Lab., YELENA BAGDASAROVA, ALEJANDRO GARCIA, RAN HONG, MATTHEW STERNBERG, DEREK STORM, ERIK SWANSON, FREDERIK WAUTERS, DAVID W. ZUMWALT, University of Washington, XAVIER FLECHARD, ETIENNE LIENARD, LPC-CAEN, ANDREAS KNETCH, Paul Scherrer Institute, OSCAR NAVILIAT-CUNCIC, Michigan State University
— Exotic current contributions to the weak interaction can be constrained through measuring the beta-neutrino angular correlation parameter $a_{\beta\nu}$ in nuclear beta decay - providing opportunities to find evidence for physics beyond the Standard Model. Our goal is to measure $a_{\beta\nu}$ with a precision of 0.1% for the beta decay of ^{6}He ($t_{1/2}$ =807ms) which is particularly sensitive to the exotic tensor currents. For this purpose, we have built a double magneto-optical trap (MOT) system to provide a cold and point-like source of ^{6}He. Of the 1x10^{10} ^{6}He atoms/s produced via the ^{7}Li(d,^{3}He)^{6}He nuclear reaction, roughly 1000 atoms/s are captured in the first MOT and periodically transferred to the second, low background MOT that is surrounded by a detector system. Coincidence detection of the beta particle and the recoiling ion offers kinematic reconstruction of $a_{\beta\nu}$ in combination with high statistic numerical simulations of the detector setup. The performance of the trap setup, preliminary coincidence data, and studies of systematic uncertainties will be presented. This work is supported by DOE, Office of Nuclear Physics, under contract nos. DE-AC02-06CH11357 and DE-FG02-97ER41020.

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