

Abstract Submitted  
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**High Precision Determination of the  ${}^6\text{He}$  Half-life<sup>1</sup>** RAN HONG, BRENT DELBRIDGE, ALEJANDRO GARCIA, GREGORY HARPER, ANDREASE KNECHT, ROBERT ROBERTSON, ERIK SWANSON, SATOSHI UT-SUNO, DOUGLAS WILL, CHRISTOPHER WREDE, DAVID ZUMWALT, University of Washington, PETER MUELLER, WILL WILLIAMS, Argonne National Lab — We performed a high precision measurement of the half-life of  ${}^6\text{He}$ . The motivation for this experiment lay not only in resolving a long-standing discrepancy between the previous most precise measured values of  $806.7 \pm 1.5$  ms and  $798.1 \pm 1$  ms, but also in serving as a solid basis for the extraction of the axial coupling constant  $g_A$  by comparing the result to ab initio calculations. The measurement took place at the tandem accelerator of the Center for Experimental Nuclear Physics and Astrophysics of the University of Washington where we used the  ${}^7\text{Li}(d, {}^3\text{He})$  reaction to produce  ${}^6\text{He}$ . We directed a  $10 \mu\text{A}$ , 18 MeV deuteron beam onto a liquid lithium target station that delivers  $\sim 10^9$  atoms/s to a low-background experimental area where the amount of other short-lived isotopes, particularly  ${}^8\text{Li}$ , is greatly reduced. Here we present the design of the lithium target station, the  ${}^6\text{He}$  half-life experiment setup and the half-life determination process.

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