Contribution ID: **29** Type: **Poster**

Towards a new study of the electron-neutrino angular correlation in the decay of magneto-optically trapped 6He

Tuesday, 12 October 2010 17:00 (0 minutes)

Studies of nuclear beta decay have a long standing history in testing the Standard Model of particle physics. With the dominant (V-A) structure of the weak interaction determined, measurements of the angular correlation between the electron and neutrino momenta in nuclear beta decay can be used to search for scalar and tensor contributions to the weak interaction.

The current best measurement on the electron-neutrino angular correlation coefficient in the decay of 6He dates back to 1963 by measuring the energy spectrum of the recoiling 6Li nucleus and amounts to -0.3343 +/- 0.0030 [1]. Its compatibility with the Standard Model expectation allows to constrain tensor contributions to (|C_T|^2+|C'_T|^2)/(|C_A|^2+|C'_A|^2)<0.4%.

We intend to improve on this measurement by confining 6He atoms in a magneto-optical trap and detecting the recoiling nucleus and emitted electron in coincidence. The foreseen sensitivity in the measurement of the angular correlation coefficient will be approximately 0.1%. Here, we will present the details and current status of the experiment focussing on the performance of the 6He production and the magneto-optical trapping of the 6He atoms.

[1] C. H. Johnson, F. Pleasonton and T. A. Carlson, Phys. Rev. 132, 1149 (1963).

Primary author: KNECHT, Andreas (University of Washington)

Co-authors: GARCIA, Alejandro (University of Washington); PALMER, Andrew (University of Washington); DELBRIDGE, Brent (University of Washington); WREDE, Chris (University of Washington); ZUMWALT, David (University of Washington); WILL, Doug (University of Washington); HARPER, Greg (University of Washington); ROBERTSON, Hamish (University of Washington); MUELLER, Peter (Argonne National Laboratory); WILLIAMS, William (Argonne National Laboratory); LU, Zheng-Tian (Argonne National Laboratory)

Presenter: KNECHT, Andreas (University of Washington)

Session Classification: Poster Session