Contribution ID: **103** Type: **Oral Presentation**

Neutron Bound beta- Decay- BOB

Tuesday, September 6, 2011 11:30 AM (20 minutes)

J.McAndrew, S.Paul, M. Berger, R. Emmerich, R. Engels,T.Faestermann,
P. Fierlinger, M. Gabriel, E. Gutsmiedl,F. J. Hartmann, R. Hertenberger, A. Röhrmoser, S.Ruschel, J Schön, W.Schott, U.Schubert, D.Simon, A.Trautner, Th. Udem, A. Ulrich

The bound neutron beta-decay(BOB) into a hydrogen atom and an electron antineutrino is investigated. The hyperfine-state population of the monoenergetic hydrogen atoms yields the neutrino left-handedness or a possible right-handed admixture and possible small scalar and tensor contributions to the weak force. The BOB H(2s) hyperfine states are separated with a Lamb shift spin filter. The monoenergetic 326 eV BOB H(2s) atoms are detected either by quenching
yielding Lyman-alpha photons, or charge exchanging into H^- ions within a 1 mbar argon cell. A first experiment is planned at the FRM2 high thermal neutron flux beam reactor SR6 through-going beam pipe, where the H^- coming from BOB H(2s) and H(1s), being 10 eV different in kinetic energy, are to be separated with a MAC- E filter. This should be possible because the Doppler broadened BOB H atom energy width due to the thermal motion of the decaying neutrons is reduced by suppressing axially moving neutrons with absorbing traps built into SR6 on both sides. The 10 eV H^- energy difference between charge exchanged H(2s) and H(1s) which were produced by a proton beam from a plasma source traversing a cesium cell, has been measured with an electric counter field mockup setup. A MAC- E filter is being built. Furthermore, the BOB branching ratio to the three- body decay should be obtained. In a second experiment at the ILL high flux beam reactor H6- H7 through-going beam tube, the BOB H(2s) hyperfine state population is to be measured.

Primary author: Dr MCANDREW, Josephine (TU Munich)

Co-author: Dr SCHOTT, Wolfgang (TU Munich)

Presenter: Dr MCANDREW, Josephine (TU Munich)

Session Classification: Precision Experiments II

Track Classification: Other exotic atoms and rare decays