Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Development of a Low Energy Threshold Germanium Detector for Measuring Neutrino Magnetic Moments ISELEY MARSHALL, DONGMING MEI, The University of South Dakota, CUBED COLLABORATION — Since it is understood that the neutrino has mass, it is also evident that the neutrino will have a magnetic moment proportional to its mass. Current experimental reports indicate that the neutrino magnetic moment (u_ν) will be greater than or around $10^{-20}u_B$. This number, however, is a lower bound, and extensions from the Standard Model yield larger possible magnetic moments. We can potentially measure the neutrino magnetic moment (NMM) by studying the electron recoil energy in a given detector. The NMM contribution to the differential scattering cross section for electron neutrinos or antineutrinos occurs at very low recoil energies. In order to detect this electromagnetic reaction, it is beneficial to use an experiment where the measurable electronic recoils are below 100 eV. In this project, we show the development of a low energy threshold germanium detector with internal amplification that will measure the NMM at Homestake, using a large artificial neutrino source.

Iseley Marshall
The University of South Dakota

Date submitted: 01 Jul 2013 Electronic form version 1.4