Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

An Overview of the ^{6}He CRES Experiment[1] WILLIAM BYRON, University of Washington, HELIUM6 CRES COLLABORATION — The ^{6}He CRES experiment at the University of Washington CENPA aims to precisely measure the Fierz coefficient b_{fierz} which parameterizes a distortion of the beta-decay spectrum that is proportional to m/E, the mass divided by the energy of the beta-decay electron. A measurement of b_{fierz} with a 10^{-3} uncertainty would be competitive with current LHC measurements. The decay of ^{6}He has a large endpoint ($Q(^6\text{He}) \approx 3.5\,MeV$) which allows for the m/E distortion to vary by about a factor of 7 over the spectrum and therefore leads to high sensitivity to b_{fierz}. Using Cyclotron Radiation Emission Spectroscopy (CRES) (a technique demonstrated by the Project 8 collaboration) the ^{6}He CRES experiment based at the University of Washington CENPA will have high energy resolution and be shielded from systematics that affect traditional means of electron spectroscopy. We expect to have an event rate of ≈ 1 event/ms and need $\sim 10^8$ events for a 10^{-3} measurement of b_{fierz}. With a few days of data we should have sufficient statistics for a competitive measurement. Hardware and software progress towards the observation of our first CRES event will be presented.

[1]The author is supported by the DOE Office of Nuclear Physics under Grant DE-FG02-97ER41020.

William Byron
University of Washington

Date submitted: 01 Jul 2020 Electronic form version 1.4