Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

The BetaCage: Ultrasensitive Screener for Radioactive Backgrounds MICHAEL THOMPSON, South Dakota School of Mines Technology, BETACAGE COLLABORATION — Rare event searches, such as dark matter detection and neutrinoless double beta decay, require screening of materials for backgrounds such as beta emission and alpha decaying isotopes. The BetaCage is a proposed ultra-sensitive time-projection chamber to screen for alpha-emitting and low energy beta-emitting (10-200 keV) contaminants. The expected sensitivity is 0.1 beta particles ($perkeV - m^2 - day$) and 0.1 alpha particles ($perm^2 - day$), where the former will be limited by Compton scattering of external photons in the screening samples and the latter is expected to be signal-limited. The prototype BetaCage under commissioning at South Dakota School of Mines Technology is filled with P10 gas (10% methane, 90% argon) in place of neon and is 40 x 40 x 20 cm in size. Details on design, construction and characterization will be presented.

Michael Thompson
South Dakota School of Mines
Technology

Date submitted: 02 Aug 2017 Electronic form version 1.4