Abstract Submitted
for the APR11 Meeting of
The American Physical Society

BetaCage: an Ultra-sensitive Screener for Surface Contamination ZEESHAN AHMED, SUNIL GOLWALA, Caltech, DARREN GRANT, University of Alberta, MARK KOS, Syracuse University, ROBERT NELSON, Caltech, RICHARD SCHNEE, BOQIAN WANG, Syracuse University — Commercial radioactivity counting techniques for alpha and beta particles are unable to meet the stringent screening requirements for next-generation low-background rare-event search experiments because of inadequate sensitivity. To meet this need, we are developing a new screener, BetaCage, a gaseous neon time-projection chamber. Using radiopure materials for construction, active and passive shielding from extrinsic backgrounds, large counting area and minimal detector mass, BetaCage will be able to achieve sensitivities of 10^{-5}counts keV^{-1}kg^{-1}day^{-1} in a few days of running time. We present the status of a prototype we are currently building and testing, to inform the design and construction of the final version.

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Date submitted: 10 Jan 2011 Electronic form version 1.4