

Ultra-Low-Background Material Screening with the BetaCage Time Projection Chamber

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High-sensitivity, low-threshold material surface screening is necessary to meet the stringent radiopurity requirements for rare-event searches. The BetaCage is a proposed ultra-low-background time projection chamber (TPC) designed to screen alphas and low-energy betas emitted from material surfaces at trace levels, providing a transformative effect on isotopic assay efforts. I will describe the TPC design, the expected backgrounds and mitigation techniques, the estimated alpha and beta sensitivity, and the commissioning of a prototype TPC currently deployed at SDSM&T.

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