

# Surface Alpha Counting with XIA

Next generation rare event search experiments focusing on neutrinoless double beta decay or direct dark matter detection will require ever-more stringent control of radioactive backgrounds to achieve improvements in sensitivity. A critical background arises from radon daughters plated out onto, or implanted within, detector components. The radon daughters give rise to neutron and gamma-ray backgrounds from ( $\alpha$ ,n) and Bremsstrahlung interactions, respectively. Radon “plate out” on material surfaces may result in decay daughters, such as  $^{212}\text{Bi}$ , detaching and entering the sensitive volume.

Current screening relies heavily on the use of high purity germanium instrumentation, however, gamma spectroscopy alone cannot distinguish between surface and bulk contamination. Surface alpha counters may be employed to provide additional information thus separating surface and bulk activity.

Surface and bulk alpha activity measurements using an ultra low background surface alpha counter, the XIA UltraLo-1800, are presented.

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