

Abstract Submitted
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Using Ultracold Neutrons to Characterize Fission Fragment Induced Sputtering¹ LEAH BROUSSARD, MARK MAKELA, CHRIS MORRIS, Los Alamos National Laboratory — One of the modern challenges in nuclear science and technology is the understanding of the nature of fission fragment damage to material and the resulting ejection of matter as the fragments pass through the surface, with implications to stockpile stewardship and nuclear energy. We have demonstrated a new technique that can be used to characterize the sputtered material with knowledge of the location of the originating fission event. Due to their very high fission cross sections, ultracold neutrons (~ 100 neV energy) can be used to control the depth at which fission takes place using their energy or the material enrichment. This effort represents one of the first practical applications of ultracold neutrons, which to date have been primarily used to explore questions in fundamental particle physics. We will present results of demonstration measurements including first limits on the total and fission cross sections for 100 neV scale neutrons and the status of the development of this new capability.

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