

Abstract Submitted
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Retrospective dosimetry in radiological emergency response, epidemiology and nuclear nonproliferation.¹ RYAN O'MARA, FATMA ABDELRAHMAN, EGEMEN ARAS, ALEEM TAREEN, North Carolina State University, ROBERT BRUCE HAYES TEAM — The RDNA group at NC State has demonstrated how ubiquitous items such as ceramics, foodstuffs and effectively every insulator material found in society can serve as a radiation dosimeter to some extent. The techniques utilized include thermoluminescence, optically stimulated luminescence and electron paramagnetic resonance spectrometry. Using these to measure dose depth profiles into properly prepared materials, incident radiation fields can be reconstructed with low resolution equivalency. Sampling over a grid has been shown to enable spatial source reconstruction utilizing inverse square dependencies. Items found commonly on a person such as confectionary or simple electronics have been shown to serve as excellent dosimeters approaching natural background levels when integrated over many years. It is finally shown how these can serve in reconstructing emergency triage doses in any large scale population exposure. Likewise dose reconstruction for epidemiology and even in nuclear nonproliferation from a forensics perspective have been demonstrated as viable applications.

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