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Use of GaN as a Scintillating Ionizing Radiation Detector¹ JOHNATHAN WENSMAN, Georgetown University, NOEL GUARDALA, VEERENDRA MATHUR, Naval Surface Warfare Center, Carderock Division, LESLIE ALASAGAS, JEFFREY VANHOY, JOHN STATHAM, DANIEL MAR-RON, MARSHALL MILLETT, United States Naval Academy, JARROD MARSH, United States Army Research Laboratory, JOHN CURRIE, Georgetown University, JACK PRICE, Naval Surface Warfare Center, Carderock Division — Gallium nitride (GaN) is a III/V direct bandgap semiconductor which has been used in light emitting diodes (LEDs) since the 1990s. Currently, due to a potential for increased efficiency, GaN is being investigated as a replacement for silicon in power electronics finding potential uses ranging from data centers to electric vehicles. In addition to LEDs and power electronics though, doped GaN can be used as a gamma insensitive fast neutron detector due to the direct band-gap, light propagation properties, and response to ionizing radiations. Investigation of GaN as a semiconductor scintillator for use in a radiation detection system involves mapping the response function of the detector crystal over a range of photon and neutron energies, and measurements of light generation in the GaN crystal due to proton, alpha, and nitrogen projectiles. In this presentation we discuss the measurements made to date, and plausible interpretations of the response functions.

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