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Neutron and Gamma Imaging for National Security Applications

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The Department of Energy, National Nuclear Security Administration (NNSA), Office of Defense Nuclear Nonproliferation Research and Development (DNN R&D/NA-22) possesses, in part, the mission to develop technologies in support of nuclear security efforts in coordination with other U.S. government entities, such as the Department of Defense and the Department of Homeland Security. DNN R&D has long supported research in nuclear detection at national labs, universities, and through the small business innovation research (SBIR) program. Research topics supported include advanced detector materials and electronics, detection algorithm development, and advanced gamma/neutron detection systems. Neutron and gamma imaging, defined as the directional detection of radiation as opposed to radiography, provides advanced detection capabilities for the NNSA mission in areas of emergency response, international safeguards, and nuclear arms control treaty monitoring and verification. A technical and programmatic overview of efforts in this field of research will be summarized.