

Abstract Submitted  
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**Using an Inertial Electrostatic Confinement (IEC) Nuclear Fusion Device as a Pulsed Neutron Source: Optimizing the Pulse Shape<sup>1</sup>**  
RICHARD BONOMO, University of Wisconsin — Pulsed neutron sources may prove to be valuable for detecting illicit nuclear materials in items being smuggled across borders or checkpoints. Work already accomplished by Sorebo et al. [1] at the U. of Wisconsin demonstrated the basic detection concept by successfully detecting delayed  $^{235}\text{U}$  fission neutrons using neutron pulses generated by an IEC fusion device. Numerical studies imply the detection of the much more copious prompt induced-fission neutrons would be preferable; the experimental detection of prompt neutrons represents a challenge: the prompt, fission-produced neutron and interrogating neutron pulses may overlap. After IEC device operation and past work by Sorebo et al. are reviewed, efforts to produce a properly shaped interrogating neutron pulse are described. Efforts drawing, in part, on techniques used in hard-switched power inverters are highlighted.

[1] J.H. Sorebo, G.L. Kulcinski, R.F. Radel, and J.F. Santarius, “Special Nuclear Materials Detection Using IEC Fusion Pulsed Neutron Source,” *Fusion Science and Technology* **56**, 540 (2009).

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John Santarius  
University of Wisconsin

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