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Non-electric applications for magneto-inertial fusion JOHN SLOUGH, University of Washington — In addition to the generation of commercial electric power, there are several other applications for an intense pulse of neutrons that would be produced by magneto-inertial fusion (MIF) systems. Many of these applications can be achieved without the need for a fully developed reactor at high gain, and could thus be pursued at a much earlier stage of development which would dramatically reduce the risk of the long-term development and concern for the expense of an all-encompassing, single use system such as the tokamak or stellerator. A short list of applications well suited for MIF would include: (1) production of radioisotopes for medical applications and research, (2) efficient, high power propulsion through direct fusion heating of lithium propellants (3) Noninvasive interrogation of objects for homeland security (4) neutron radiography and tomography (5) destruction of long-lived radioactive waste, and (6) breeding of proliferation proof fissile fuel for existing nuclear reactors. These applications could all be pursued at lower neutron yield, but clearly the energy goals are by far the most significant and far reaching such as applying fusion energy as a hybrid to enable thorium cycle reactors which produce very little waste compared to the current uranium reactors. A discussion of how MIF could be configured and utilized to realize several of these uses will be discussed.

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