

Abstract Submitted  
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**Fusion-Fission Burner for Transuranic Actinides** CHAN CHOI, Purdue University — The 14-MeV DT fusion neutron spectrum from mirror confinement fusion can provide a unique capability to transmute the transuranic isotopes from light water reactors (LWR). The transuranic (TRU) actinides, high-level radioactive wastes, from spent LWR fuel pose serious worldwide problem with long-term decay heat and radiotoxicity. However, “transmuted” TRU actinides can not only reduce the inventory of the TRU in the spent fuel repository but also generate additional energy. Typical commercial LWR fuel assemblies for BWR (boiling water reactor) and PWR (pressurized water reactor) measure its assembly lengths with 4.470 m and 4.059 m, respectively, while its corresponding fuel rod lengths are 4.064 m and 3.851 m. Mirror-based fusion reactor has inherently simple geometry for transmutation blanket with steady-state reactor operation. Recent development of gas-dynamic mirror configuration has additional attractive feature with reduced size in central plasma chamber, thus providing a unique capability for incorporating the spent fuel assemblies into transmutation blanket designs. The system parameters for the gas-dynamic mirror-based hybrid burner will be discussed.

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