Abstract Submitted
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SABR Fusion-Fission Hybrid Studies CHRIS STEWART, NRE Program, Georgia Tech — The Subcritical Advanced Burner Reactor (SABR) concept is a fast reactor comprised of a tokamak fusion neutron source based on ITER surrounded by an annular fission core adapted from Integral Fast Reactor designs. Previous work has examined SABR used to help close the nuclear fuel cycle by fissioning the transuranics from spent nuclear fuel. One focus of the present work is a SABR Breeder Reactor to achieve tritium self-sufficieny and a Pu breeding ratio significantly above 1 in order to provide fuel for SABR as well as for MOX-fueled LWR's and other fast reactors. Another focus of this research is the dynamic safety simulation of lloss-of-flow loss-of-heat-sink, loss-of-power, and positive reactivity accidents in the TRU fuel SABR burner reactor. The reactivity effect of thermal-induced bowing of fuel pins has been modeled, which is expected to provide passive safety.

Weston Stacey
NRE Program, Georgia Tech

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