Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Fission fusion hybrids- recent progress M. KOTSCHENREUTHER, P. VALANJU, S. MAHAJAN, B. COVELE, University of Texas — Fission-fusion hybrids enjoy unique advantages for addressing long standing societal acceptability issues of nuclear fission power, and can do this at a much lower level of technical development than a competitive fusion power plant- so it could be a nearer term application. For waste incineration, hybrids can burn intransigent transuranic residues (with the long lived biohazard) from light water reactors (LWRs) with far fewer hybrid reactors than a comparable system within the realm of fission alone. For fuel production, hybrids can produce fuel for $\sim$4 times as many LWRs with NO fuel reprocessing. For both waste incineration or fuel production, the most severe kind of nuclear accident- runaway criticality- can be excluded, unlike either fast reactors or typical accelerator based reactors. The proliferation risks for hybrid fuel production are, we strongly believe, far less than any other fuel production method, including today's gas centrifuges. US Thorium reserves could supply the entire US electricity supply for centuries. The centerpiece of the fuel cycle is a high power density Compact Fusion Neutron Source (major+minor radius $\sim$ 2.5-3.5 m), which is made feasible by the super-X divertor.

Michael Kotschenreuther
University of Texas

Date submitted: 10 Jan 2012 Electronic form version 1.4