Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Conceptual study of fusion-driven transmutation reactor with ITER physics and engineering constraints BONG GUEN HONG, Chonbuk National University — A conceptual study of fusion-driven transmutation reactor was performed based on ITER physics and engineering constraints. A compact reactor concept is desirable from an economic viewpoint. For the optimal design of a reactor, a radial build of reactor components has to be determined by considering the plasma physics and engineering constraints which inter-relate various reactor components. In a transmutation reactor, design of blanket and shield play a key role in determining the size of a reactor; the blanket should produce enough tritium for tritium self-sufficiency, the transmutation rate of waste has to be maximized, and the shield should provide sufficient protection for the superconducting toroidal field (TF) coil. To determine the radial build of the blanket and the shield, not only a radiation transport analysis but also a burnup calculation were coupled with the system analysis and it allowed the self-consistent determination of the design parameters of a transmutation reactor. .

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Date submitted: 29 Aug 2011 Electronic form version 1.4