

# POTENTIAL OF MYRRHA WITH THORIUM FUEL AS AN ACTINIDE BURNER

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## Abstract

MCNPX and Geant4 simulations are performed to examine the potential of MYRRHA reactor with thorium fuel as an actinide burner. We predict the fluxes and energy spectra of neutrons at several relevant positions in the core, for the standard uranium/plutonium fuel mixture, for thorium with a fissile U/Pu starter, and for an asymptotic Th/U mix. These are used to investigate the breeding of fissile U from fertile Th and the possibilities for incineration of Minor Actinides. MYRRHA will be a pioneering ADS system and studies of its possibilities are important. No such studies have been done using thorium as fuel. Although MCNPX is a standard program for such studies, use of the more modern and adaptable Geant4 is a new development. We show that the reactor will breed fissile fuel from thorium, and that the incineration of Minor Actinides, though not in itself a significant contribution to the problem, is enough to form a basis of knowledge for later production systems.