MODELING NEUTRON BEHAVIOR IN TRISO FUEL
PARTICLES IMDEDED IN A GRAPHITE MATRIX WITH
GEANT4

1 Abstract

Renewed interest in nuclear power has prompted the search and development of
analytical tools to model the new Generation IV reactor designs. One of these designs is
the Pebble Bed Modular Reactor (PBMR), which is a high temperature graphite mod-
erated and helium cooled reactor. The reactor core contains roughly 452,000 pebbles.
The pebbles are composed of graphite and TRISO fuel particles with 9.6wt percent U235.
The purpose of this paper is to model the behavior of neutrons inside these pebbles. An
isotropic neutron gun and a model of the medium are build with GEANT4 to simulate
the PBMR reactor environment. The neutron scattering rates and their subsequent en-
ergy loss, as well as the dislocations produced in the SiC layer of the TRISO are studied.
Comparison to the MCNP code, which is a well stablished code for reactor calculations,
will help validate the GEANT4 results.
References

