

Dose estimation using ACTYS for 3D Benchmark geometry by coupling to neutronics output spectrum

Abstract

Nuclear particle transport and activation analysis code are essential part for the validation and estimation of the radioactive waste from fission/fusion reactors along with the requirement for the preparation of commissioning and decommissioning plan. For a complete nuclear analysis two class of codes i.e. neutron transport and nuclear activation are needed.

ITER-India, Institute for Plasma Research, have developed a state of art computer code suite for nuclear activation analysis called ACTYS.

For the activation analysis and dose rate estimation over the mesh for the complete geometry it is needed to couple the point analysis with the mesh output as produced by the neutronics code e.g. MCNP or Openmc. The objective is to couple the ACTYS code by post processing the output from neuronics code using input geometry and neutron spectrum at different mesh points.

Scope of work

1. Understanding neutronic geometry format and input file
2. Reading input file
 - 2.1. Extracting the geometry information
 - 2.2. Extracting material reference and data
3. Reading output file
 - 3.1 Reading mesh points and corresponding spectrum for required mesh tallies
4. Preparing ACTYS input files and estimation of dose rate

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.Sc. Physics

3) Academic Project duration:

(a) Total academic project duration: 11 Weeks

(b) Student's presence at IPR for academic project work: 5 Full working Days per week

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