

# Deep neural network for radiation calculation

## Abstract

High temperature Plasma are being studied towards realization of Fusion energy. The fusion plasma experiments causes different types of radiations such as gamma rays, neutrons etc. These radiations effect the surroundings. Thus it is required to keep the radiation exposure of a working personal under stringent limits decided by competent authorities. It is mandatory to calculate the radiation fluxes and dose rate values due to the Fusion plasma experiments, which primarily comprises of high energy neutrons. For this purposed MCNP is widely used software which works on the Monte Carlo algorithm to get the good approximation of the radiations around such radioactive environment. This code is internationally proven and acceptable, but it takes lots of computing hours to solve for tokamaks like ITER-complex.

Here it is advised to explore the capability of neural networks to accurately mimic the results of MCNP. If such model is developed which can produce the results at par with MCNP than, it can save lots of computing hours as neural networks do not solve the complex equations of nuclear reactions.

## Academic Project Requirements:

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

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

3) Academic Project duration:

(a) Total academic project duration: 24 Weeks

(b) Student's presence at IPR for academic project work: 2 Full working Days per week

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