Variance Reduction with MCNP6

14-18 October 2019

Class length: 5 days of instruction
Time: 10:00 Monday to noon Friday
Place: NEA, Boulogne-Billancourt (Paris), France

Number accepted in class: 18
Minimum enrolment required: 8

This class focuses on applying variance reduction techniques in MCNP6 for fixed source neutron, photon, and coupled neutron/photon calculations. It is an intermediate to advanced level class, intended for those users with at least some familiarity with MCNP and understanding of variance reduction techniques. Class examples provide hands-on experience at running the code, applying/tuning variance reduction techniques, working with event logs, and understanding the code output.

Variance reduction techniques/topics to be covered include:

- Implicit capture and weight cut-off
- Geometry splitting and Russian roulette
- Forced collisions
- Exponential transform
- Weight windows and weight windows generator
- Weight windows and adjoint functions
- Source biasing
- DXTRAN
- Point and Ring detectors

The class includes lectures and hands-on computer use for a variety of variance reduction calculations. Time will be available to discuss individual questions and problems with the MCNP developers, and to pursue additional variance reduction topics.

The course material is roughly organised as:

- Day 1: Introduction and review of basic variance reduction methods
- Day 2: Advanced techniques and problems

- Day 3: Advanced techniques and problems
- Day 4: Advanced techniques and problems
- Day 5: Advanced hands-on practicum, individual problems, and wrap-up

Course attendees are encouraged to have basic experience working with MCNP6. Attendees should be familiar with working on a Microsoft Windows XP environment using either Windows or Cygwin tools.

The class will be based on the latest release of MCNP6 code. You are expected to have some experience with MCNP. **You should hold a licence for the export controlled MCNP6.2 software.** The only distribution centre for this software is RSICC, please request your licence at https://rsicc.ornl.gov/

Address all correspondence regarding this class to programs@oecd-nea.org