Chapter 8

MCNP TERMINATION PARAMETERS

There are two termination criteria in Monte Carlo calculation: termination of an individual random walk and termination of all random walks.

The CUT card sets the cut-off parameters that decides when a random walk is to be terminated. It determines for each particle type, the age, energy and weight below which the particle is killed. Note that for neutrons, the PHYS:N card defines the energy in MeV above which implicit (non-analog) capture is allowed and below which analog capture is used; to define in effect the upper energy limit of thermal neutrons. Weight cut-off is treated in conjunction with cell importance and whether analog capture is required or not, consult the manual. The ELPT card allows the user to set a cut-off energy for each cell.

Their are five ways to terminate an MCNP job:

1. Number of particle histories (NPS card). A negative entry of NPS is allowed only in a continue-run to instruct the code to print an output file at the time of the last history and subsequently stop (useful for example to obtain additional print-out that was not obtained initially). In criticality calculations, NPS has no meaning.

2. Computer execution time in minutes (CTME).

3. Job time-limit, as specified by the job control language.

4. The end of a supplied surface source file.

5. The number of cycles in a criticality problem (KCODE card).

If more than one is in effect, the job will be terminated after reaching the first parameter.

8.1 Work Problems

1. For an MCNP sample problem of your choice, examine the INP file and list all random walk termination parameters. Make sure to list the default termination values, if not given in the INP file.