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Intercomparison of Particle Production (5)

Wednesday, 29 May 2024 08:40 (20 minutes)

In accordance with the discussion at SATIF15, we propose the same intercomparison problems of particle production from targets. Relatively large differences are observed for neutron and proton especially at small and large angles between Geant-4, PHITS, FLUKA-2021.2 and FLUKA 4-2.2. Results by using MARS and MCNP were desired to include in this intercomparison.

At SATIF16, we will present comparison between major Monte Carlo codes including MARS and MCNP concerning particle production with high energy protons.

"Inter-comparison problems of particle production (4)"

1. Incident particle
   Pencil beam of protons with the following energy
   (a) 1 GeV
   (b) 10 GeV
   (c) 100 GeV

2. Target materials and their sizes
   Target geometry is the cylinder.
   Source protons incident on the center of the cylinder bottom.
   Target detector distance from the center of the cylinder is 500 cm.
   (a) Al : length 40 cm, diameter 4.0 cm and density 2.7 g/cm^3
   (b) Cu : length 16 cm, diameter 1.6 cm and density 8.63 g/cm^3
   (c) Au : length 10 cm, diameter 1.0 cm and density 19.3 g/cm^3

3. Quantities to be calculated
   (1) Neutron, proton, pion+, pion- and photon spectrum above 20 MeV in particles/MeV/sr/proton
   at 0, 15, 30, 45, 60, 90, 120, 150 degrees with angular width plus/minus 0.5 degrees.
   Photons from produced radionuclides are not necessary to include.
   (2) Angular integral spectrum above 20 MeV in particles/MeV/proton
   (3) Energy integral neutron fluence for (1) and (2)

Scientific Topic 1

Scientific Topic 2

Scientific Topic 3

Code benchmarking and intercomparison

Scientific Topic 4

Scientific Topic 5

Scientific Topic 6

Scientific Topic 7

Scientific Topic 8

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