



Questionnaire results

Introduction to FLUKA and fundamentals of Monte Carlo simulations

(36 submitted replies. Thank you!)

Introduction to FLUKA and Monte Carlo

- The most relevant quantity for estimating the probability of Single-Event Effects in electronics in a high-energy accelerator context is:
 - A. Thermal neutron fluence. 1 (2.78%)
 - B. Energy deposition. 20 (55.56%)
 - C. High-energy hadron fluence. 13 (36.11%)
 - D. X-ray fluence. 2 (5.56%)
- Which of the following statements is true?
 - A. Running a simulation with twice the number of histories will yield results with half the statistical uncertainty. 0 (0.00%)
 - B. Running the same simulation with different random seeds will produce identical results. 1 (2.78%)
 - C. A sufficiently large number of contributions to a Monte Carlo estimator follows a normal distribution around the expectation value of the physical observable being estimated. 30 (83.33%)
 - D. . Random number sequences produced during a Monte Carlo simulation cannot be exactly reproduced a second time. 5 (13.89%)

Introduction to FLUKA and Monte Carlo

- How can you best estimate whether a simulation is sufficiently covering the phase-space of your problem?
 - A. Running 1 cycle with 1,000,000 particles.: 0 (0.00%)
 - **B. Running 5 cycles with 200,000 particles each.: 34 (94.44%).**
 - C. Running 1 cycle with 1,000,000 particles, but with a very high random seed.: 1 (2.78%)
 - D. Running 1 cycle with 1,000,000 particles with energies following a normal distribution with known σ .: 1 (2.78%)
- Which of the following statements is true?
 - A. Systematic errors contribute to the statistical uncertainty of Monte Carlo estimators.: 9 (25.00%)
 - B. The accuracy of a result is ensured by achieving low statistical uncertainty.: 18 (50.00%)
 - C. Cross-section uncertainties cancel each other out when running multiple cycles.: 0 (0.00%)
 - **D. The inclusion of trace elements in material definitions may be necessary to obtain accurate results.: 9 (25.00%)**

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- Which of the following statements is true?
 - A. A Monte Carlo simulation can follow the time-evolution of material degradation.: 5 (13.89%)
 - B. It is in general possible to solve the transport equation analytically.: 6 (16.67%)
 - C. Monte Carlo simulations of radiation transport can be run for primary energies of 50 eV regardless of the particle species.: 4 (11.11%)
 - D. The particle step length in a Monte Carlo simulation is sampled from an exponential distribution.: 21 (58.33%)

