Questionnaire results

Introduction to FLUKA and Monte Carlo

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- The most relevant quantity for estimating the probability of Single-Event Effects in electronics is:
  - A. Thermal neutron fluence: 2 (5.71%)
  - B. Energy deposition: 23 (65.71%)
  - C. High-energy hadron fluence: 7 (20.00%)
  - D. x-ray fluence: 3 (8.57%)

- 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 (2.86%)
  - 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: 29 (82.86%)
  - D. Random number sequences produced during a Monte Carlo simulation cannot be exactly reproduced a second time: 5 (14.29%)

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- 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: 1 (2.86%)
  - B. Running 5 cycles with 200,000 particles each: 34 (97.14%)
  - C. Running 1 cycle with 1,000,000 particles, but with a very high random seed: 0 (0.00%)
  - D. Running 1 cycle with 1,000,000 particles with energies following a normal distribution with known σ: 0 (0.00%)

- Which of the following statements is true?
  - A. Systematic errors contribute to the statistical uncertainty of Monte Carlo estimators: 10 (28.57%)
  - B. The accuracy of a result is ensured by achieving low statistical uncertainty: 18 (51.43%)
  - 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: 7 (20.00%)

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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 (14.29%)
  - B. It is in general possible to solve the transport equation analytically: 7 (20.00%)
  - C. Monte Carlo simulations of radiation transport can be run for primary energies of 50 eV regardless of the particle species: 6 (17.14%)
  - D. The particle step length in a Monte Carlo simulation is sampled from an exponential distribution: 17 (48.57%)


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