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*Title:* Comparison of Monte Carlo simulations for pion production experiments

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## Comparison of Monte Carlo simulations for pion production experiments

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There is renewed interest in creating pion beams that can provide a higher muon luminosity, through pion decay and focusing magnets, than the cosmic-ray flux for both active interrogation and radiography. Specifically, long-range interrogation of vessels by measuring the emissions from an energetic muon beam interacting in the vessel provides a possible means of special nuclear material (SNM) detection for maritime applications. We conducted two series of pion-production experiments at the Proton Radiography (PRAD) beam line in the Los Alamos Neutron Scattering Center (LANSCE) using 800 MeV protons impinging on graphite targets. Simulations in support of this experimental effort will be presented. We compare simulation results using GEANT4, MCNPX, and MARS15 with the experimental data as well as to the historical pion production data of D.R.F. Cochran.

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