Neutron distributions from spallation targets, parametrised using the Frankenstein Gene Expression Programming package

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Abstract

The Frankenstein package uses a hybrid of numerical and gene expression programming techniques to find and fit algebraic formulae to numerical data. This has been applied to results from Monte Carlo simulations of neutron production by proton beams on lead targets, providing parameterisations of the numbers, energies, and angular distributions of the spallation neutrons. These formulae can be used to understand and motivate target design.