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Preliminary Integration of MCNP6 and PROTEUS into the NEAMS Workbench

The DOE Nuclear Energy Advanced Modeling and Simulation (NEAMS) Program has in recent years produced many advanced tools for the simulation of nuclear energy systems. To coordinate the use of these tools, the NEAMS Integration Product Line (IPL) has created the Workbench, which seeks to present a uniform user interface for these nuclear reactor simulation codes, with convenient features for the creation and validation of modeling input, and powerful visualization capabilities to process simulation results. To date, several tools have been incorporated into the Workbench, including the Argonne Reactor Computation codes, MOOSE-BISON, and the Design Analysis Kit for Optimization and Terascale Applications. To augment the utility provided by these tools, (and in collaboration with the NEAMS Workbench developers) two high-fidelity neutron transport solvers, namely, MCNP62 and PROTEUS3, are currently being integrated into the Workbench, an effort supported by the DOE NEAMS Program. This summary presents the preliminary integration design for both neutronics solvers. Crucially, a common “Workbench Model” has been established to enable the convenient translation of models across multiple codes (and their respective domain-specific modeling languages). Thus, users can easily solve the same problem in different analysis codes without the need to repeatedly re-develop the model input for each individual code.