Team Members:
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Project Overview

Numerical simulations in radiation transport can be performed using deterministic and Monte Carlo methods as well as, after significant simplification to the Boltzmann Neutron Transport Equation, diffusion. Each method has strengths and weaknesses, making each more or less appropriate than the other for solving different problems. Hybrid methods combine deterministic and Monte Carlo techniques to optimize method speed and solution accuracy. This can be accomplished using Monte Carlo code MCNP [1] in conjunction with ADVANTG [2], which "automatically uses deterministic solutions to create variance reduction parameters for Monte Carlo" [3].

Several test cases were created by Garrett Blatz and Madicken Munk, students in Professor Slaybaugh's group. These cases were run with MCNP to examine the effect of number of histories on uncertainty behavior. For our project, we hope to expand upon this work by automating both ADVANTG calculations and comparisons to the MCNP results. We will analyze these results and their implications on the effects on hybrid methods, performing additional MCNP runs as necessary.

Deadlines

Mon, Oct 24 All team members will have requested MCNP 6 and ADVANTG 3 from RSICC
Fri, Oct 28 Planning meeting with Rachel and Madicken (4:45pm) to hammer out project details. This includes setting up the git repository, familiarizing ourselves with the included files and test cases, and defining specific project goals.
Arnika, Caroline, and Mitch will determine division of labor, including who will be responsible for which parts of the final report, based on team members' strengths and set more specific deadlines.
Fri, Nov 4 Finish installing/assembling software
Mon, Nov 7 Finish preliminary run of ADVANTG calculations and code
Fri, Nov 11 Complete preliminary draft of interim report
Sun, Nov 13 Complete final draft of interim report
Tue, Nov 15 Submit interim report
Fri, Dec 9 Complete preliminary draft of the final report and presentation
Mon, Dec 12 Complete final drafts of the report and presentation
Wed, Dec 14 Submit final report and present

Division of Labor

Once we have more clearly defined the project, Arnika, Caroline, and Mitch will meet to determine division of labor based on team members' strengths and interests.

References:
[1] T. Goorley, "MCNP6.1.1-Beta Release Notes", LA-UR-14-24680 (2014).
[2] S. Mosher, *et al.* “ADVANTG--An Automated Variance Reduction Parameter Generator.” ORNL (2013).

[3] R. Slaybaugh. “Re: a final project idea.” Message to ne255_f16. Email.