A SAMPLE ABSTRACT FOR ICTT-22

Todd S. Palmer
Department of Nuclear Engineering
Oregon State University
116 Radiation Center
Corvallis, OR 97331-5902
palmerts@ne.orst.edu

Some Other Guy
Some other place 1
Some other place 2
Some state and country
someemail@email.com

We have derived and tested a new approach to the solution of a specific class of binary stochastic mixture (BSM) transport problems. These BSM problems are characterized by realizations with materials placed into fixed set of material interface locations. The result is a system of two coupled transport equations that are derived assuming that realizations of the mixing statistics are constrained to use the *same spatial mesh*. We have tested this new mesh-based BSM transport model and it accurately reproduces the results of three-dimensional boundary-driven transport benchmark problems, even when one or both of the two materials is highly scattering.

Adams, Larsen and Pomraning [3] presented a derivation of the Standard Model by writing the three dimensional, time-independent transport equation with a fixed source and appropriate boundary conditions:

$$\hat{\Omega}\cdot\nabla\psi(\vec{r},\hat{\Omega}) + \sigma_t(\vec{r})\psi(\vec{r},\hat{\Omega}) = \frac{1}{4\pi}\sigma_s(\vec{r})\int_{4\pi}\psi(\vec{r},\hat{\Omega}')d\Omega' + \frac{1}{4\pi}Q(\vec{r}) \tag{1}$$

Table I. Material parameters for benchmark transport problems

Case	σ_t^0	Λ_0	σ_t^1	Λ_1	Case	c_0	c_1	L
1	10/99	99/100	100/11	11/100	a	0.0	1.0	0.1
2	10/99	99/10	100/11	11/10	b	1.0	0.0	1.0
3	2/101	101/20	200/101	101/20	c	0.9	0.9	10.0

We also show the benchmark and Levermore-Pomraning model ensemble-averaged material scalar flux distributions for Case 1a and $L = 10$ in Fig. 1.

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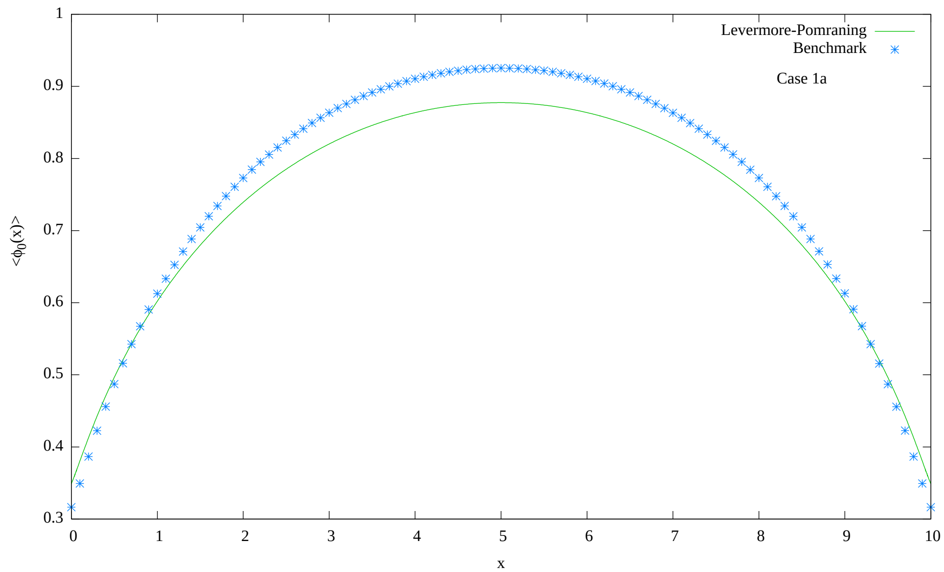

Figure 1. Comparison of $\langle \phi_0 \left(x \right) \rangle$ for Case 1a and L = 10

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