NPRE 247

Neutron Balance Computation

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May 6, 2024

Introduction

The goal of this assignment is to simulate the neutron balance in a theoretical, infinitely large steady state homogenous reactor core using eigenvalues/vectors via the power iteration method.

Theory

There would be theory here in a more ideal universe.

Part 2: Two Group Solution

eigenvalues	flux1	flux2	power iteration eigenvalue	Power iteration eigenvector
0	-0.99919	0.040353	0.996139	0.691062
0.996139	-0.97731	-0.21182		0.149779

Table 1: 2 Group Solution

Part 3: Eight Group Solution

eigenvalues	flux1	flux2	flux3	flux4	flux5
0j	(-0.982733	(0.065968!	(0.149905;	(0.053744(	(0.042799(
(1.090030!	(-0.261587	(-0.344123	(-0.78197E	(-0.280354	(-0.223263
(1.474098(	(0.708848(	(-0.198977	(0.631414(	(-0.125929	(-0.082744
(1.474098(	(0.708848(	(-0.198977	(0.631414(	(-0.125929	(-0.082744
(-2.17336C	(-0.188884	(-0.05635C	(-0.975402	(-0.035411	(0.022533(
(-1.69898!	(0.193351(	(0.006009;	(0.974829;	(0.071187;	(-0.027092
(-4.624122	(-0.304406	(0.028449;	(0.949052;	(0.043705;	(-0.007138
(9.651743(	(0.455768(	(-0.072102	(0.885967!	(-0.032568	(-0.018558

flux6	flux7	flux8	ver eigenval	ver eigenvector
(0.022546;	(0.020034;	(0.042200;	1.090031	0.092485
(-0.117611	(-0.104507	(-0.220136435491812		0.121666
(0.058927!	(-0.00100!	(-0.03564857142061(		0.276471
(0.058927!	(-0.00100!	(-0.03564857142061(		0.09912
(-0.066927	(-0.041992	(0.041633023192387(		0.078936
(0.063178;	(0.033299;	(-0.037212993489264		0.041582
(0.061877!	(0.003600!	(0.004873072182292(		0.036949
(0.003095;	(-0.00537C	(-0.026336199442182		0.07783

Table 2: 8 Group Solution, truncation not included