

HOMEWORK 4- JUNE 2023

Using two-group theory, determine the critical core width of a slab reactor with core composition like that of a PWR and surrounded by an infinite water reflector. Use the following data for the core:

| | Core | | Reflector | |
|---------------|----------|---------|-----------|---------|
| | Fast | Thermal | Fast | Thermal |
| $\nu\Sigma_F$ | 0.008476 | 0.18514 | 0 | 0 |
| Σ_A | 0.01207 | 0.121 | 0.0004 | 0.0197 |
| D | 1.2627 | 0.3543 | 1.13 | 0.16 |
| Σ_R | 0.02619 | 0.121 | 0.0494 | 0.0197 |

Other data:

- Fast fission factor over all energies = 1.27
- Reference PWR diameter = 340 cm
- Reference PWR height = 370 cm