

**NE 150 - Introduction to Nuclear Reactor Theory
Spring 2007**

Learned from Chapter 3

1. Homogeneous problems

Flux solutions for the three one-dimensional geometries, slab, cylinder and sphere, using zero-flux boundary conditions

The ∇^2 operator for these three geometries

Flux separation for two- and three-dimensional geometries

B^2 for separated geometries, e.g. cylinder in r-direction and slab in z-direction

B_{geo}^2 for a slab.

2. Inhomogeneous problems

Fluxes around a point source

Integral balance for source problems

Plane source solutions in semi-infinite source-sink problems

Interpretation of the diffusion length L

Plane source solutions in semi-infinite subproductive media ($B_m^2 < 0$)

Application of a source multiplication formula during an approach to critical for a new core.

Exponential pile

3. Reflected Cores

One-group balance equations

Reflector savings

4. Two-group solutions in subcritical systems