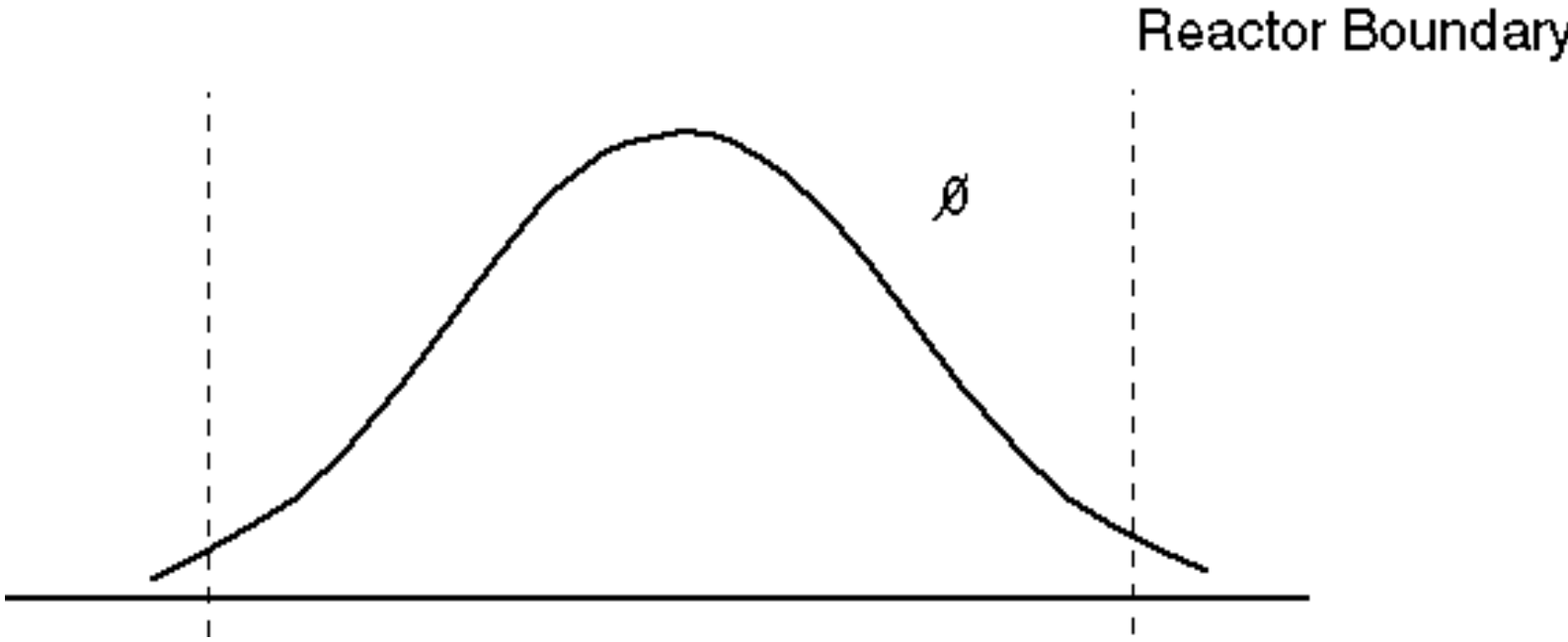
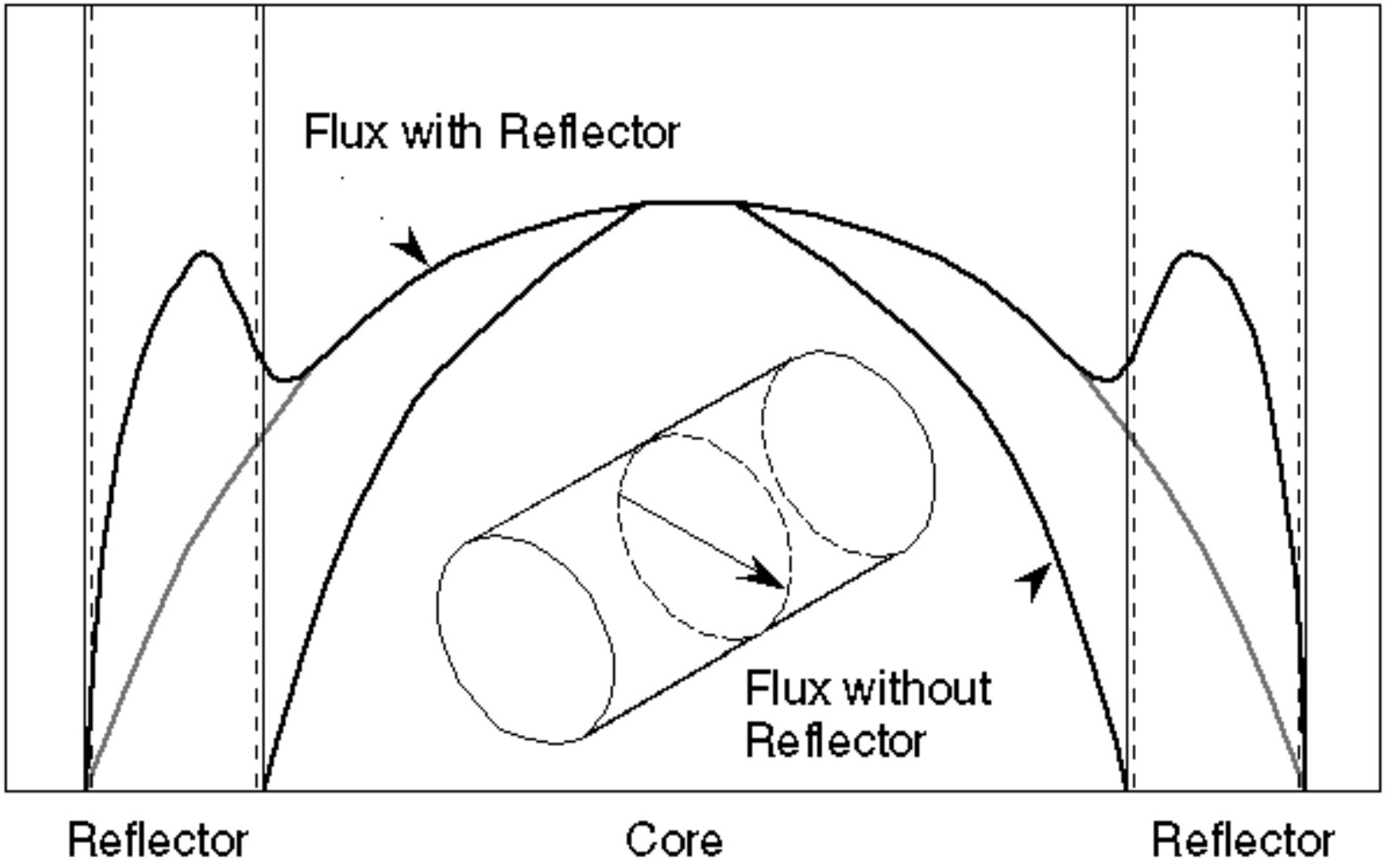
Neutron Flux Control

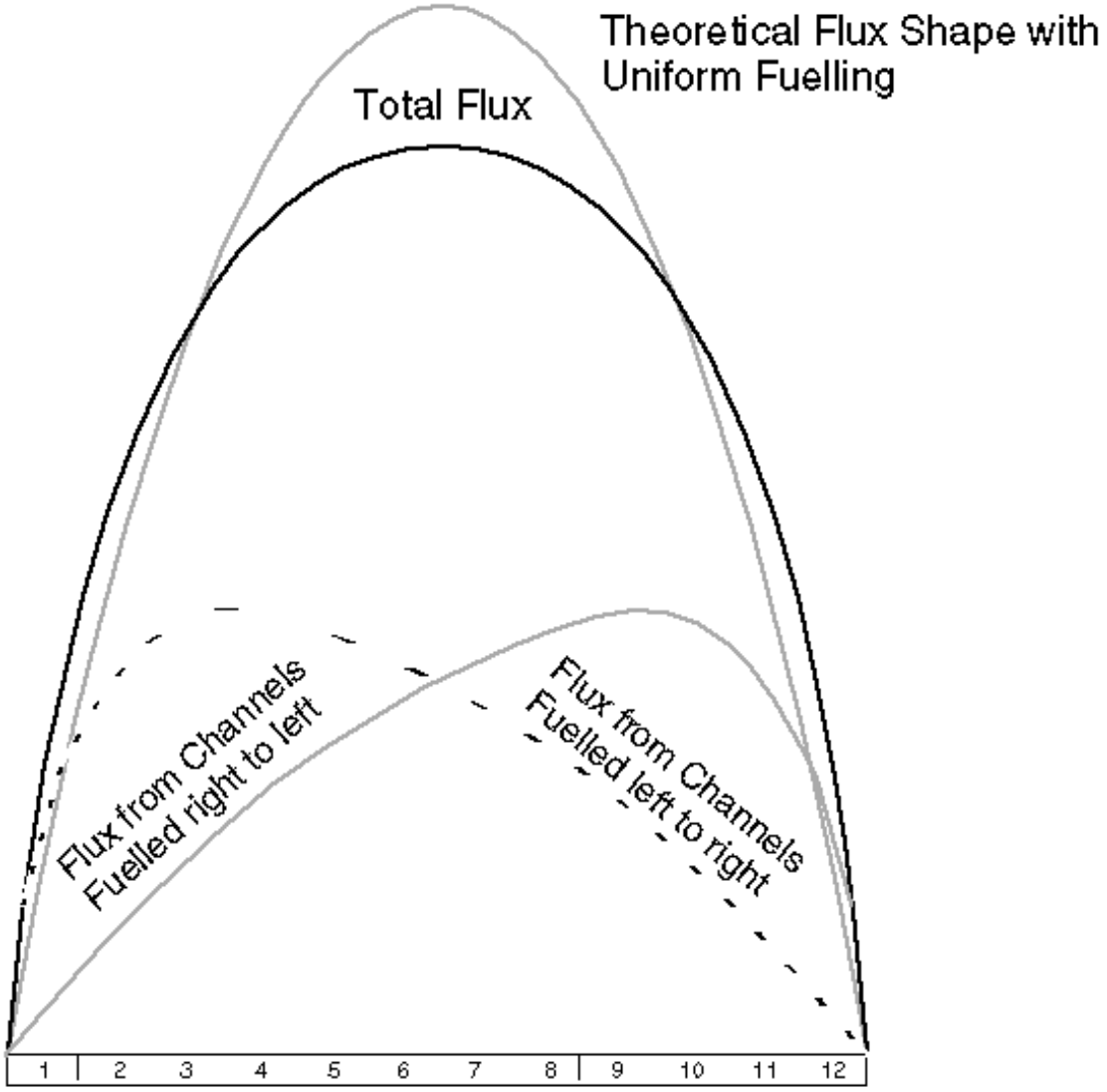
Natural Flux Shape For A Reactor



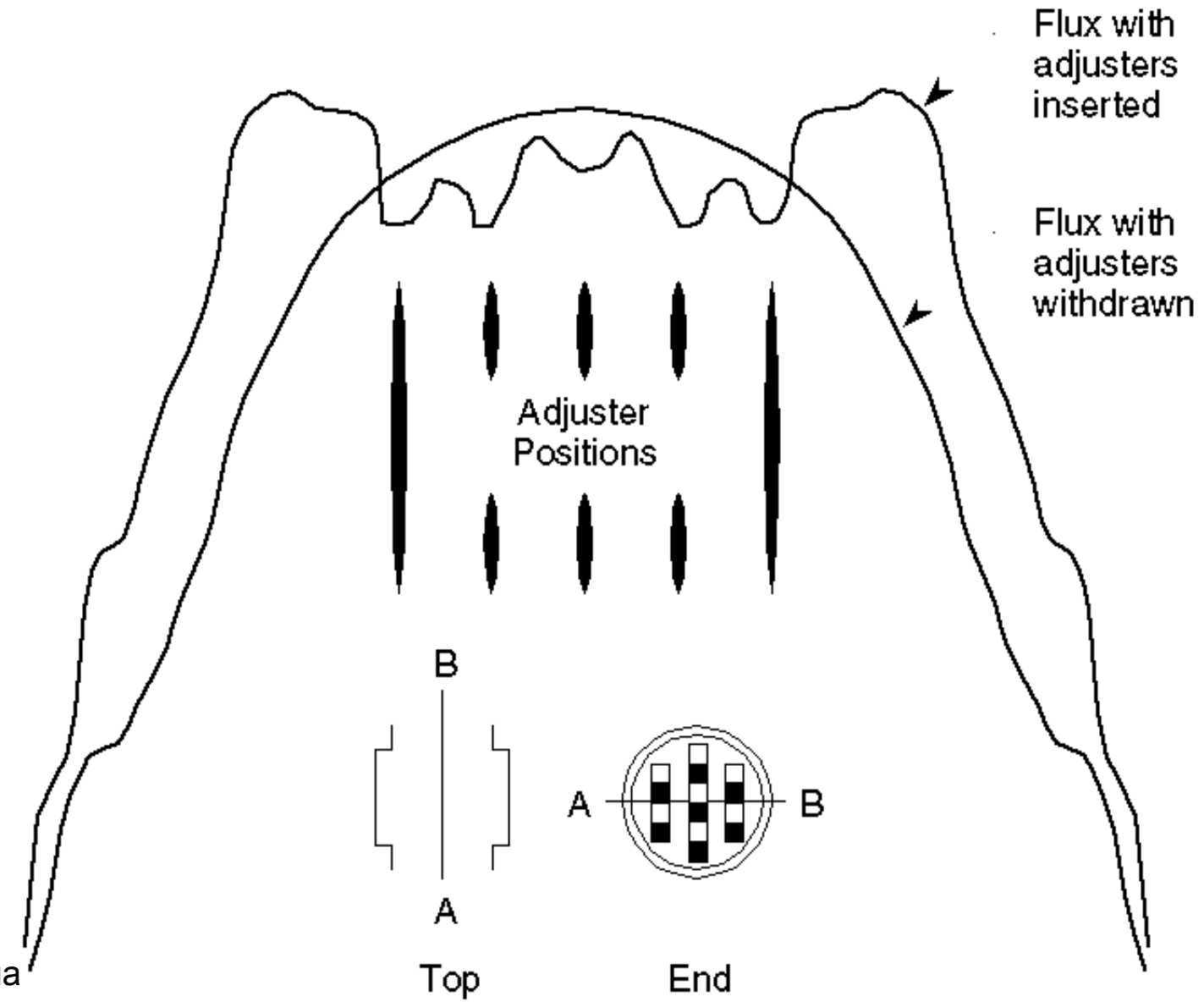
Reflector


Flux with Reflector
Flux without
Reflector
Reflector
Core
Reflector

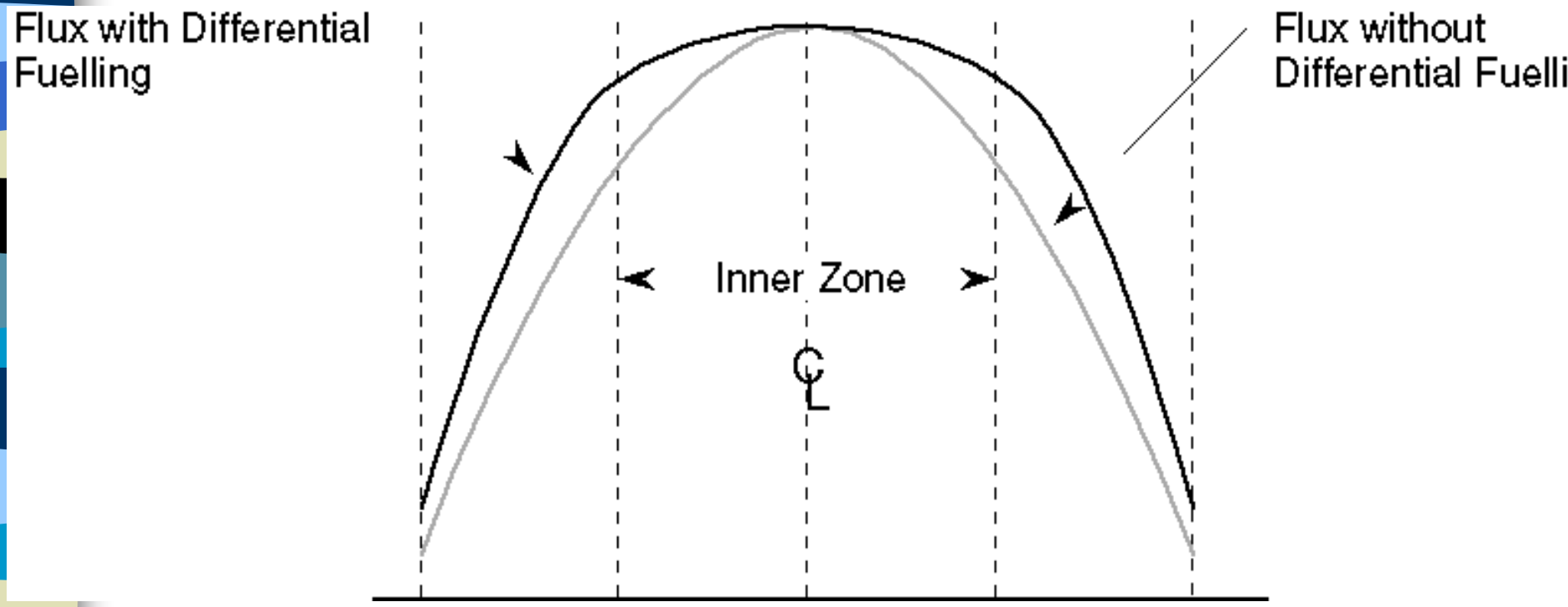
Bi-Directional Fuelling



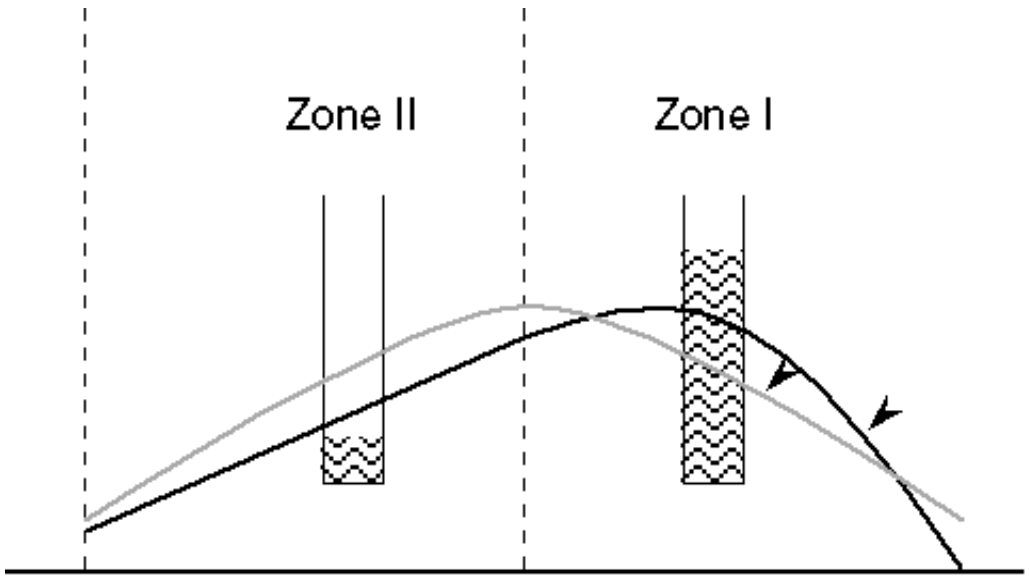
Adjusters


Flux with adjusters inserted
Flux with adjusters withdrawn
Adjuster Positions
B
A
Top
A
B
End

Differential Fuelling

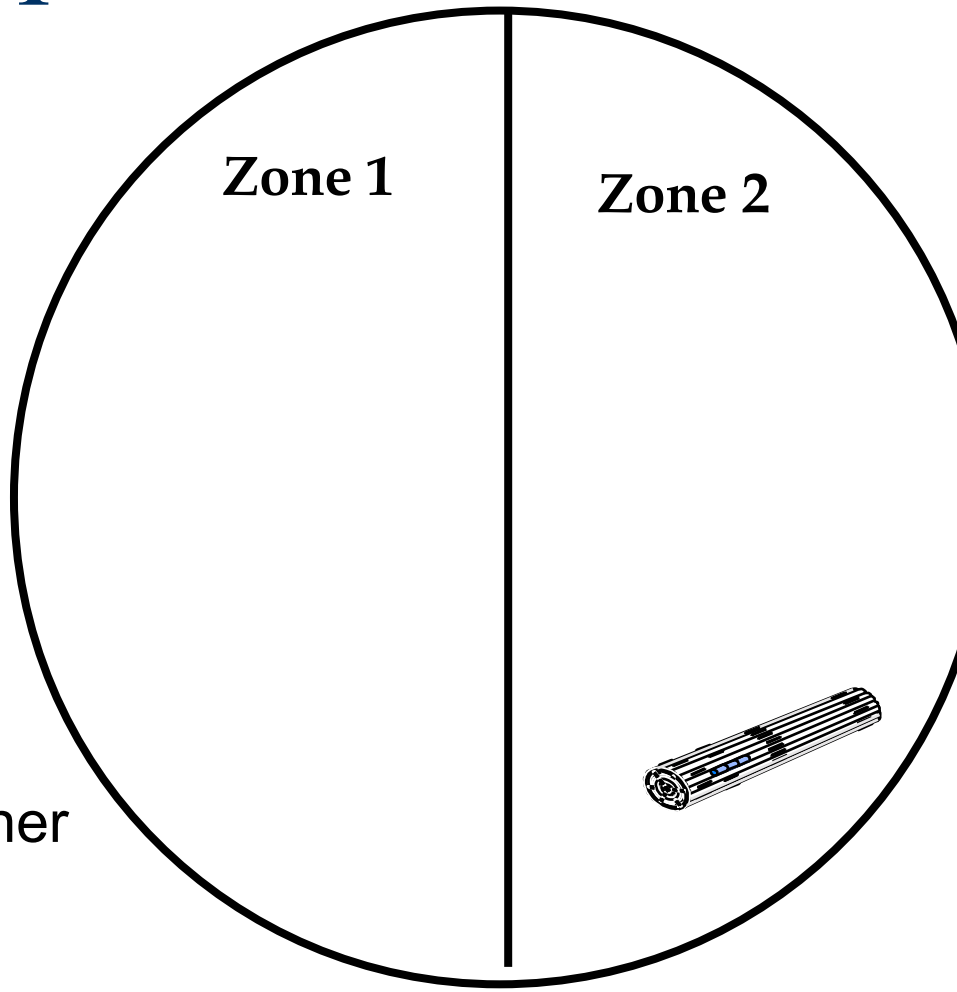


Xenon Oscillations --A Bad Thing



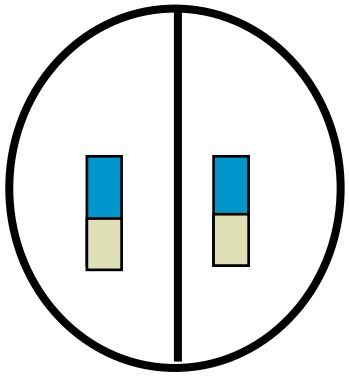
Art's Over-simplified Reactor

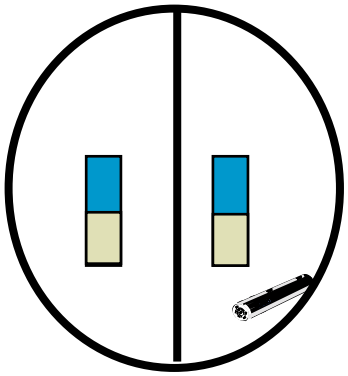
- Initial Conditions
  - Zone 1 100% power
  - Zone 2 100% power
- Fuel added to Zone 2
  - power level goes up
  - RRS reduces power
  - xenon burns up near fuel
  - xenon builds up on other side
  - trend reverses
- Xenon Oscillations

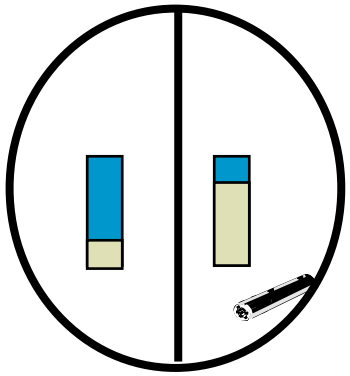


Zones Damp Xenon Oscillations

Zone 1 Zone 2







Start at equilibrium conditions

Fuel added to zone 2 power starts to go up in zone 2 down in zone 1

Level in liquid zone 2 increases, level in zone 1 decreases. Oscillations are dampe