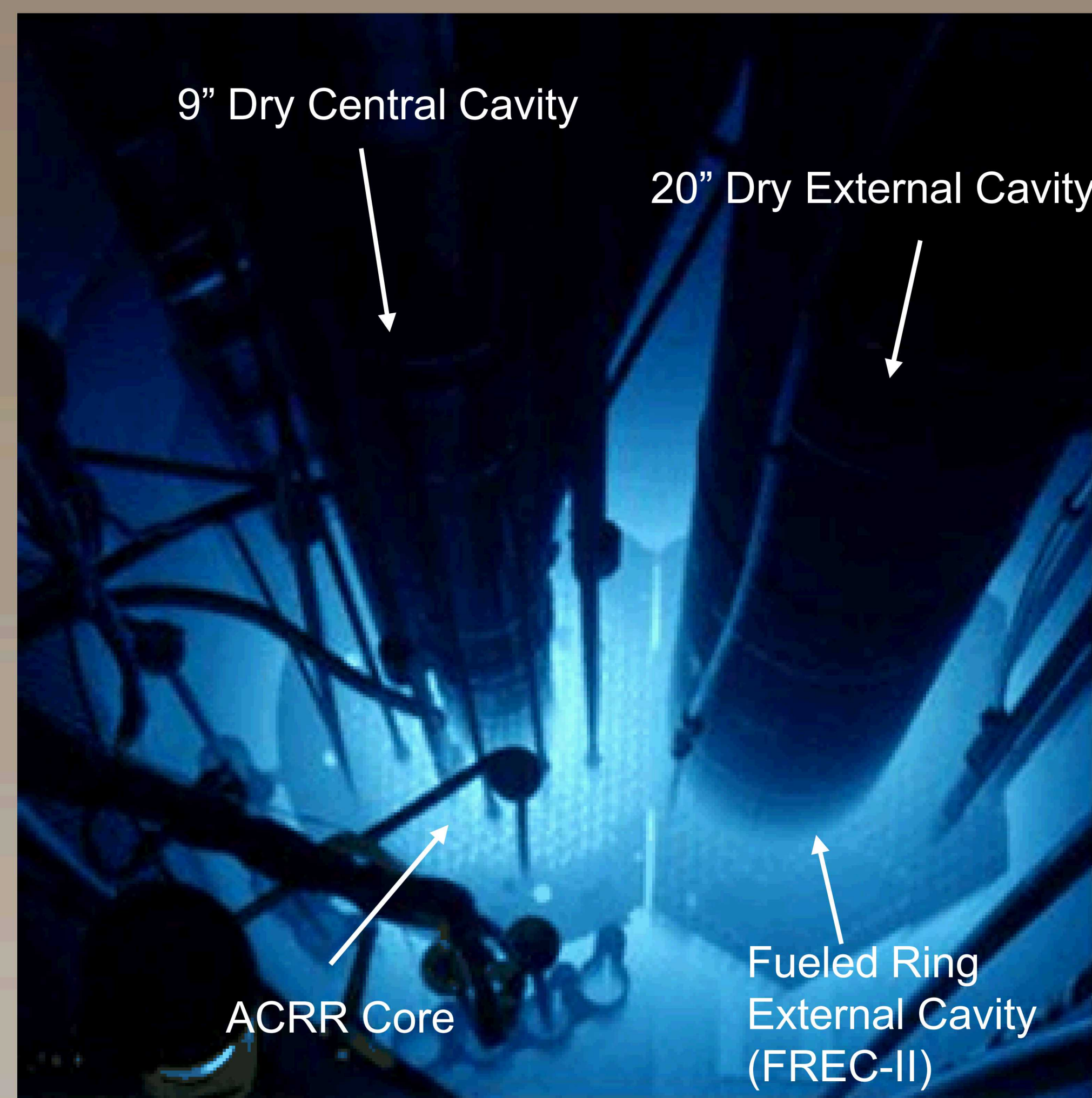


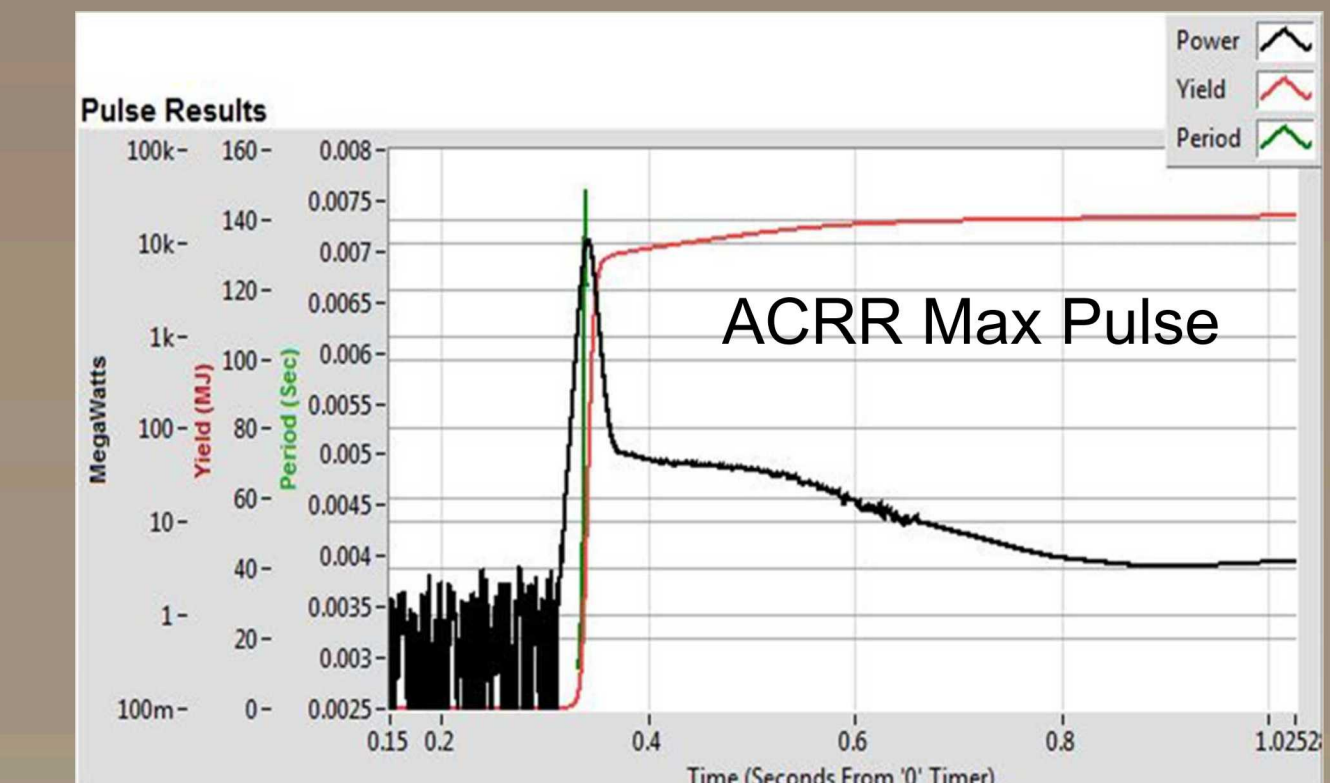
Annular Core Research Reactor
Neutron/Gamma Spectrum Modifying Environments
Ed Parma, 1384



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ACRR Design Characteristics

- 236 UO_2 -BeO fuel elements
1.5 in (3.8 cm) dia. x 20.5 in (52 cm)
100 g U-235 per element – 35% enriched
- Operating Power level
2-4 MW_{th} Steady-State Mode
250 MJ Pulse Mode (6 ms FWHM)
300 MJ Transient Mode (Programmable)
- Dry cavity 9 in (23 cm) diameter
Extends full length of pool through core
Neutron Flux $4\text{E}13$ n/cm²-s at 2 MW
65% > 1 eV, 56% > 10 keV, 45% > 100 keV
- Epithermal Spectrum
Flux in cavity can be tailored for desired energy spectrum (Poly, B4C)
- Open-pool type reactor
Core cooled by natural convection
Pool cooled by HX and cooling tower
- FREC-II uses previous ACPR fuel
-TRIGA type (UZrH)
-Dry cavity 20 in (51 cm) diameter
- Fuel burnup is minimal
- Reactor used for short duration power runs, pulses, and transients
- No competitors – No other reactor like ACRR

Current Environment Configurations

- Nominal - Free Field (FF) Environment
- Epithermal Neutron Only – Reduced Gamma – LB44. LB36
- Enhanced Thermal Neutron, Reduced Gamma – PLG, LP
- No Thermal Neutron, Enhanced Gamma – Cd-Poly
- FREC-II Environments – FF, LB, Cd-Poly

Other Configurations

- Highly Thermal Neutron – Water
- Minimal Gamma – LB-44 + Pb shot

