PISTIL, A Reactivity Modulation Device to Probe the Transfer Function of Research Nuclear Reactor CROCUS

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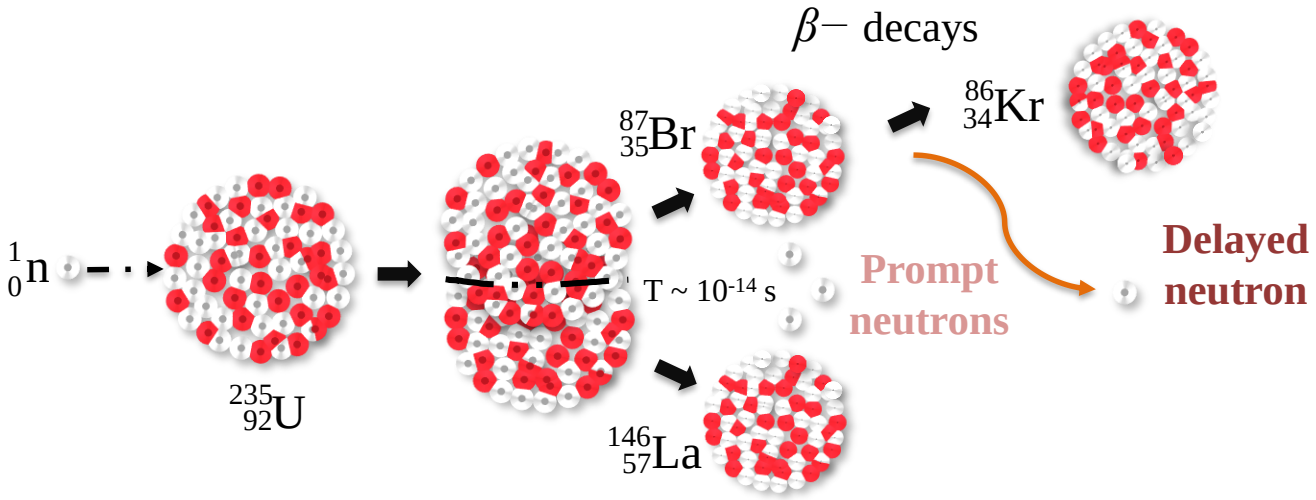
Criticality - Steady state of nuclear reactors

Absorption + Loss = Production

Capture Scattering Fission



Fission process

Importance of neutrons being <u>delayed</u>

Lifetime of neutrons in a PWR

Prompt ~ 10^{-5} s

Prompt + Delayed ~ 8 s (average)

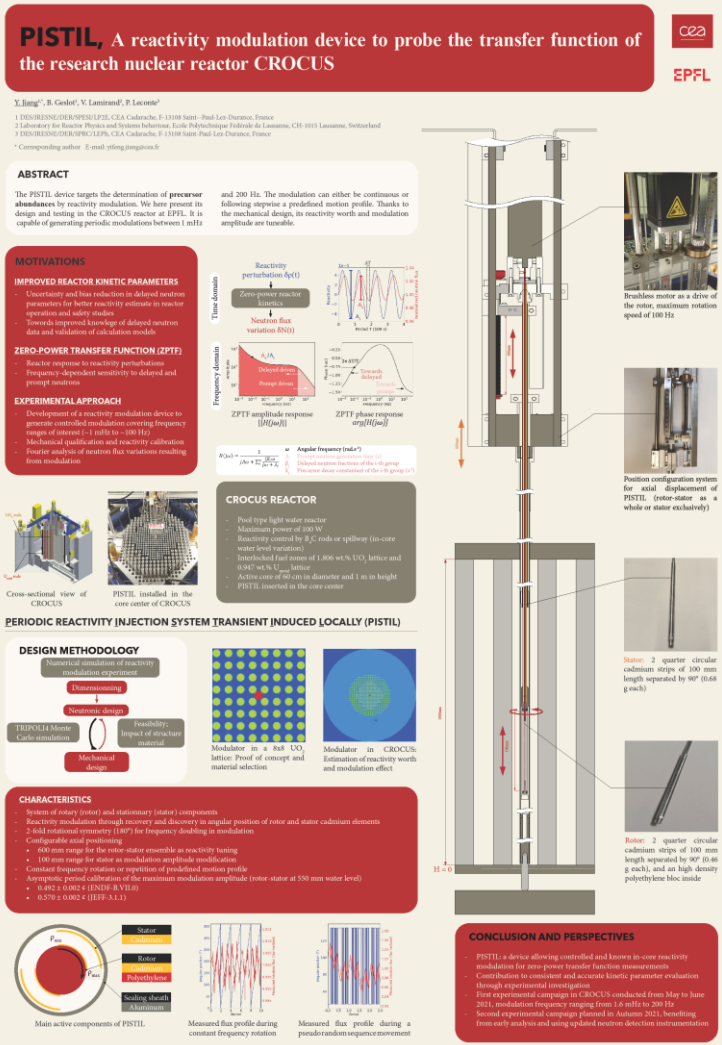
~ 0.7% of the neutron population, yet crucial to reactivity (doubling time) estimates

Discrepancies between model and calculations

Improvements of delayed neutron data

Towards better reactivity estimate in reactor operation

Reduced safety margin in accident analysis



Zero-power reactor experiment

PISTIL

Installed in the center of CROCUS

Rotation with maximum speed of 100 Hz

Reactor transfer function measurement

See you at the poster stand!