



UT-RACE experimental campaign of March 2006

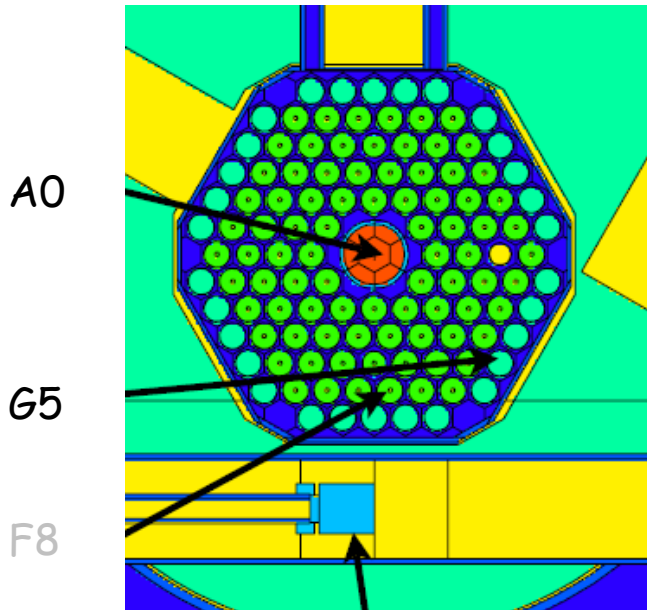
**Transient experiments
versus
PNS experiments**

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Core configuration



Detection: FC with fast amp.



Cu-W target

Transient rod was up
(960 units)

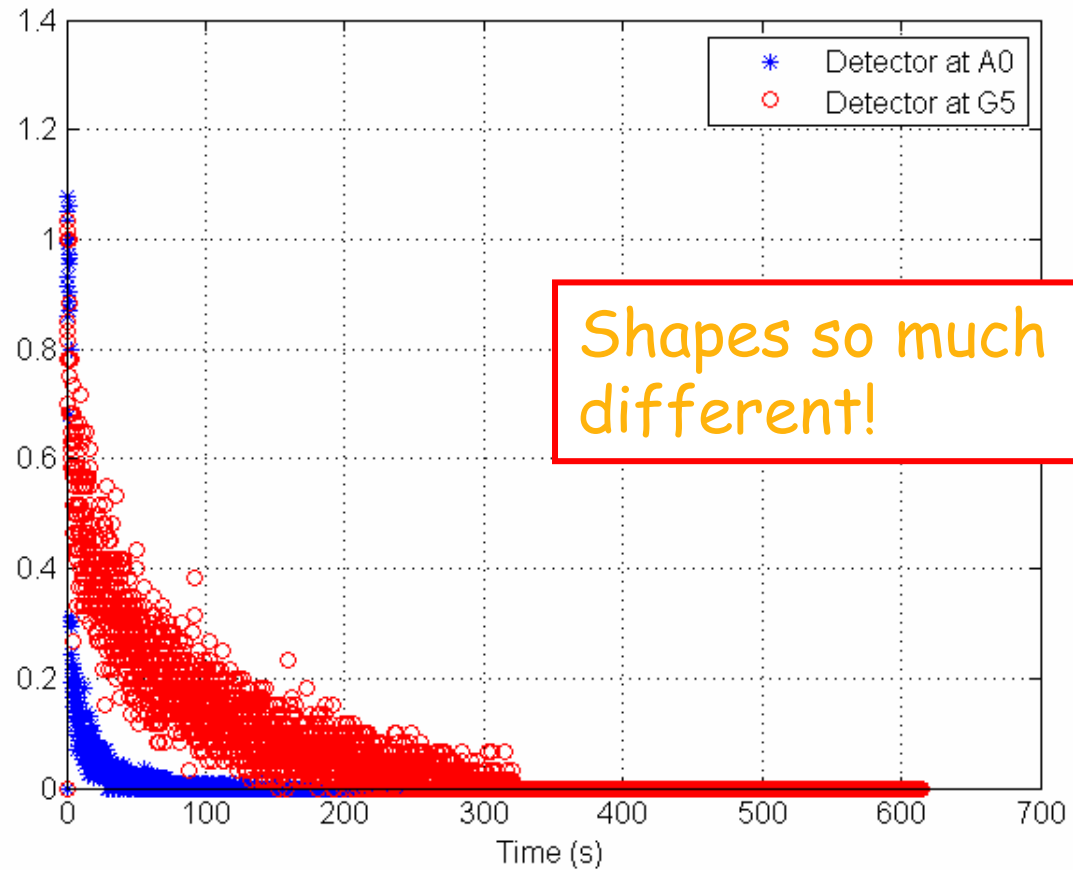
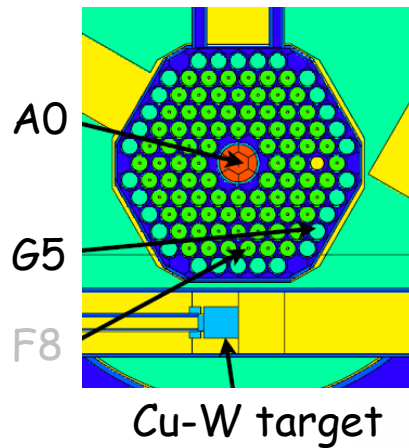
Two experiments for the
same core configuration:

- ✓ PNS experiment
- ✓ Transient experiment using the flux transient caused by the LINAC turn-off.

Transient right after turning off LINAC



Detection: FC
with fast amp.



Reactivity estimates using transient techniques



Detector at A0

FI: -5.37 \$ (5.11%*)
NF: -2.92 \$ (?%)
IK: -3.96 \$ (?%)
DJ: -1.63 \$ (~10%)

Spread: 45%

Detector at G5

FI: -0.39 \$ (5.12%)
NF: -0.24 \$ (?%)
IK: -0.28 \$ (?%)
DJ: -0.34 \$ (~10%)

Spread: 21%

Bad agreement!

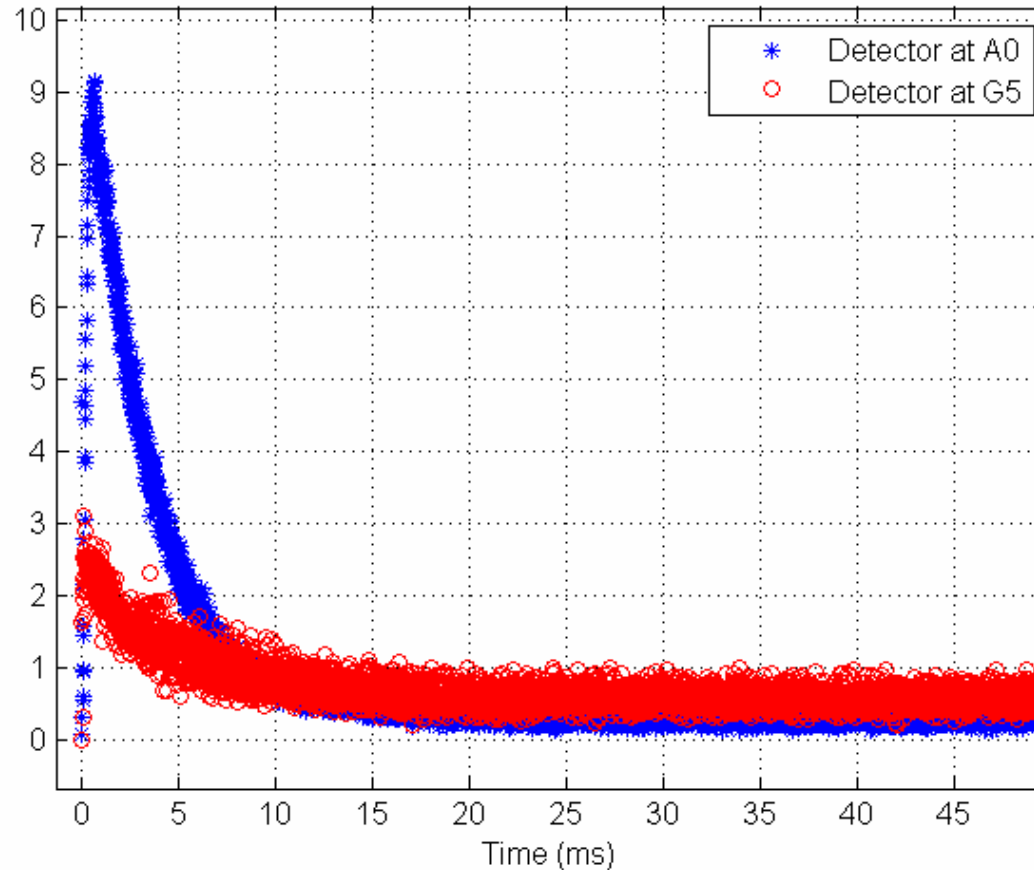
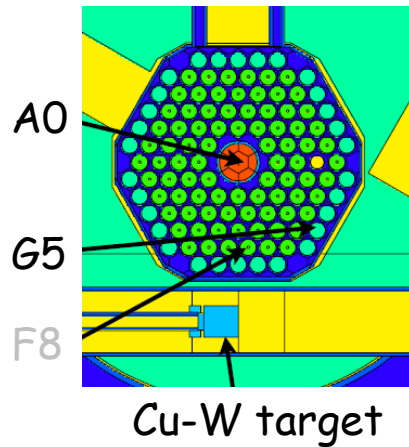
FI: Flux Integration - NF: Non-linear Fit - IK: Inverse Kinetics - DJ: Drop Jump

(*) Standard uncertainty

PNS data (LINAC on)



Detection: FC
with fast amp.



Repetition rate = 20 Hz (i.e. $T=50$ ms)

Reactivity estimates using PNS techniques



Detector at A0

Prompt decay fit

$$295 \text{ s}^{-1} \leq \alpha_p \leq 315 \text{ s}^{-1}$$

$$40 \text{ } \mu\text{s} \leq \Lambda \leq 80 \text{ } \mu\text{s}$$

$$\beta = 700 \text{ pcm}$$

$$-2.60 \text{ \$} \leq \rho \leq -0.69 \text{ \$}$$

Area-ratio

$$-2.19 \text{ \$} (1.42\%^{*})$$

Bias of 4% due to too short acquisition time of 10 min.

Detector at G5

Prompt decay fit

$$185 \text{ s}^{-1} \leq \alpha_p \leq 215 \text{ s}^{-1}$$

$$40 \text{ } \mu\text{s} \leq \Lambda \leq 80 \text{ } \mu\text{s}$$

$$\beta = 700 \text{ pcm}$$

$$-1.46 \text{ \$} \leq \rho \leq -0.06 \text{ \$}$$

Area-ratio

$$-0.43 \text{ \$} (2.30\%^{*})$$

Bias of 8% due to too short acquisition time of 10 min.

Bad agreement!

(*) Standard uncertainty

Concluding remarks



- ✓ Detectors at A0 and G5 give very different estimates
- ✓ PNS acquisition times too short
- ✓ Transient data analysis are not satisfactory too!
- ✓ However, for A0

Transient	
NF:	-2.92 \$
DJ:	-1.63 \$



PNS-Area:
-2.11 \$
(unbiased)

If so, *gamma-flash* might not be a problem ...