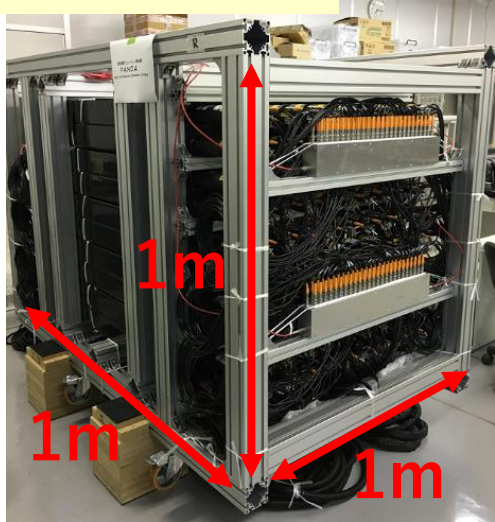


PANDA : Plastic Anti-Neutrino Detector Array

Tomoyuki Konno (Kitasato University) on behalf of PANDA collaboration

PANDA detector



- 100 of 10 x 10 x 100 cm plastic scintillator bar with two PMTs
- Scintillator : BC-408
- Surrounded by Gd loaded paper sheet for neutron
- 1 ton target volume
- No shielding (iron, concrete etc)
- No temperature control
- ~45 degrees in summer
- Read out : CAEN V792 (ADC)

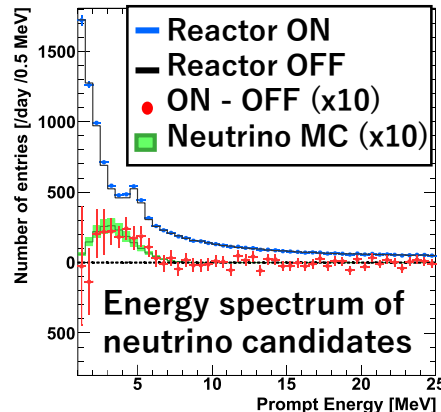
Advantage for monitor application

1. High cost-effectivity
 - 20-30 million JPY for detector and electronics
 - Almost free from operation cost (power only)
2. Real portability
 - ~ 5 people for transportation with 2 ton truck
3. Remote and unmanned control
 - Data driven calibration using ^{40}K and ^{208}Tl
 - on-site maintenance/inspection : once per month

Concern: Background is 200 time larger then ν signal

Reactor ν Measurement

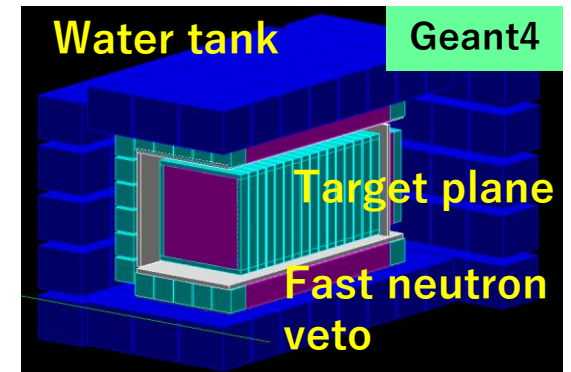
Ohi reactor power plant of KEPCO at Fukui, Japan (Hokuriku area)



- Summer in 2019
 - ~45m from core
 - ON : 20 days
 - OFF : 30 days
 - ON-OFF excess : 176 ± 34 [/day]
- => No excess is excluded by 5.1σ

Upgrade plans

- Plane segmentation with multi-MPPCs
- ^6LiF scintillator sheet for neutron
- Fast neutron veto (reuse of PANDA)



0.16 t target volume (2.5 t in total)

- BG reduction : 1/1000
- ν signals : 100[/day]