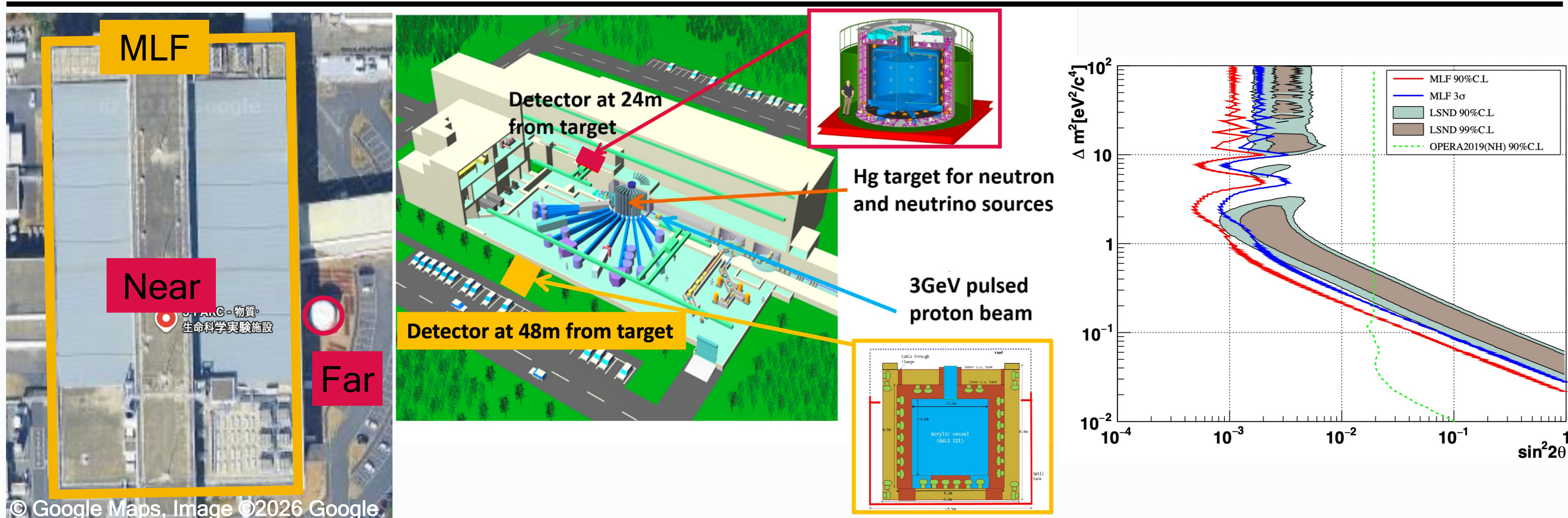


**Introduction**



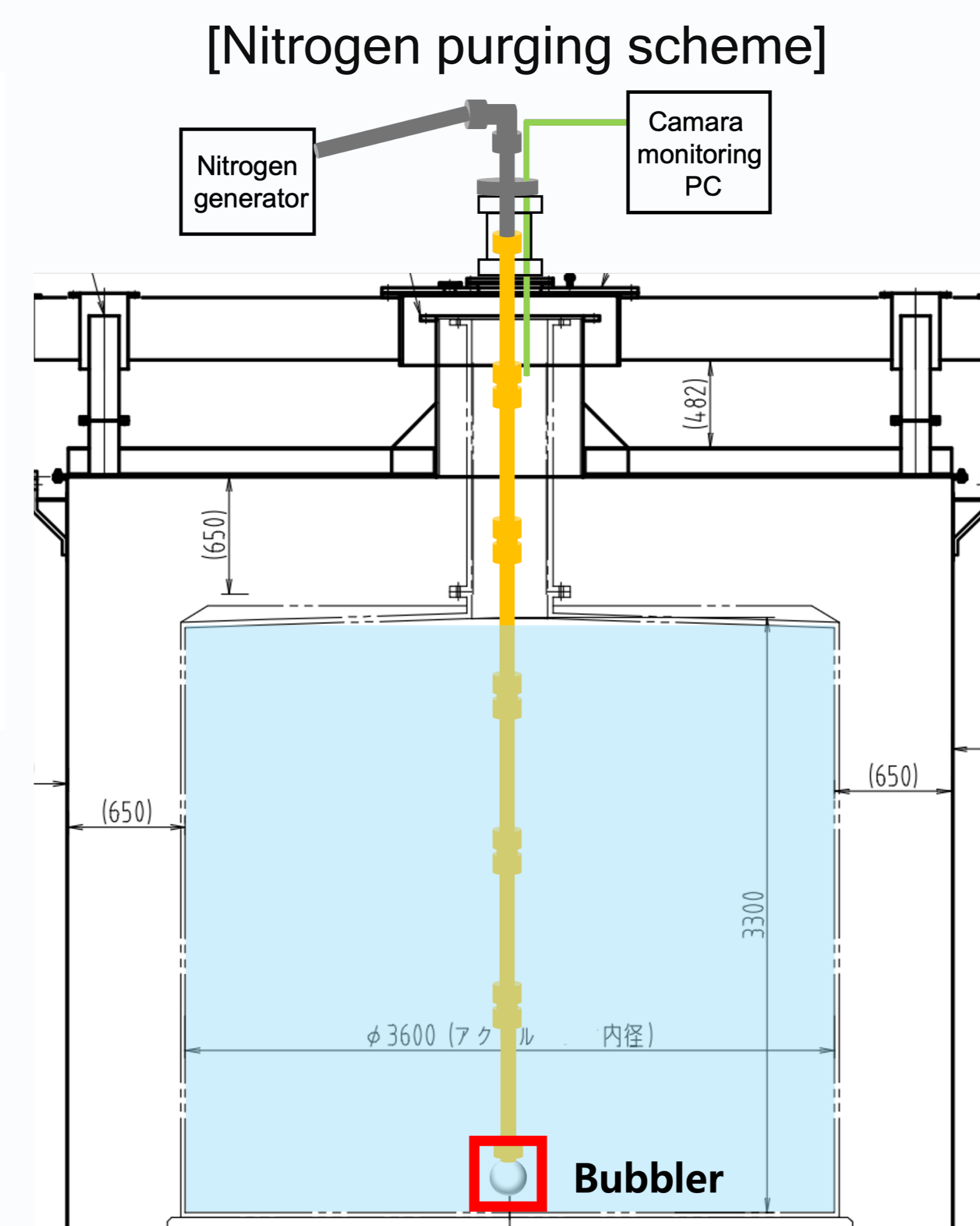
- JSNS<sup>2</sup>-II
  - Second phase of JSNS<sup>2</sup> (J-PARC Sterile Neutrino Search at J-PARC Spallation Neutron Source)
  - Searching for neutrino oscillations ( $\bar{\nu}_\mu \rightarrow \bar{\nu}_e$ ) using near and far detectors
- Far detector
  - 32 tons of Gadolinium-loaded liquid scintillator (Gd-LS)
  - 131 tons of Gd-unloaded liquid scintillator (pure LS)
  - 172 10-inch inner PMTs & 48 10-inch veto PMTs

**Level stabilizer system**

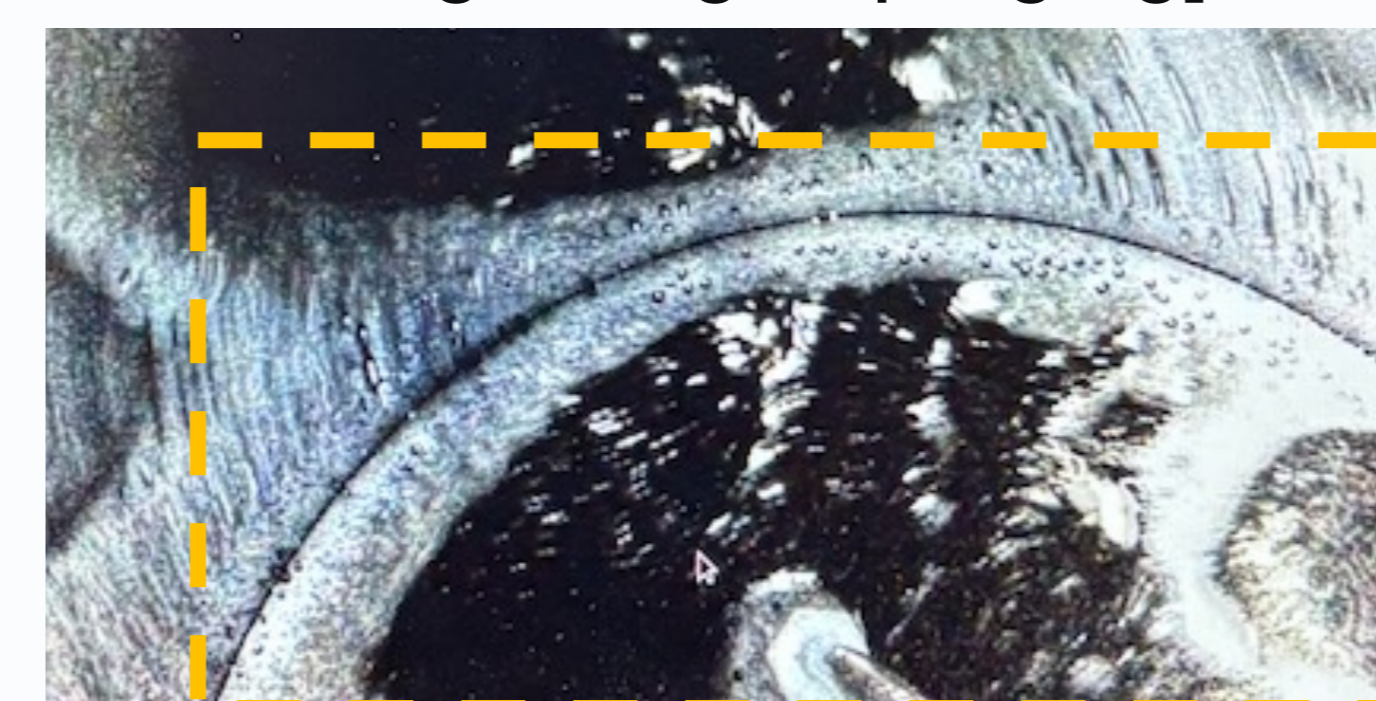


- Motivation
  - Large temperature variation
  - Constant pure LS level required
- System design
  - Inverse siphon system with vacuum pump and buffer
- Reduced temperature-induced pure LS level variations after operation

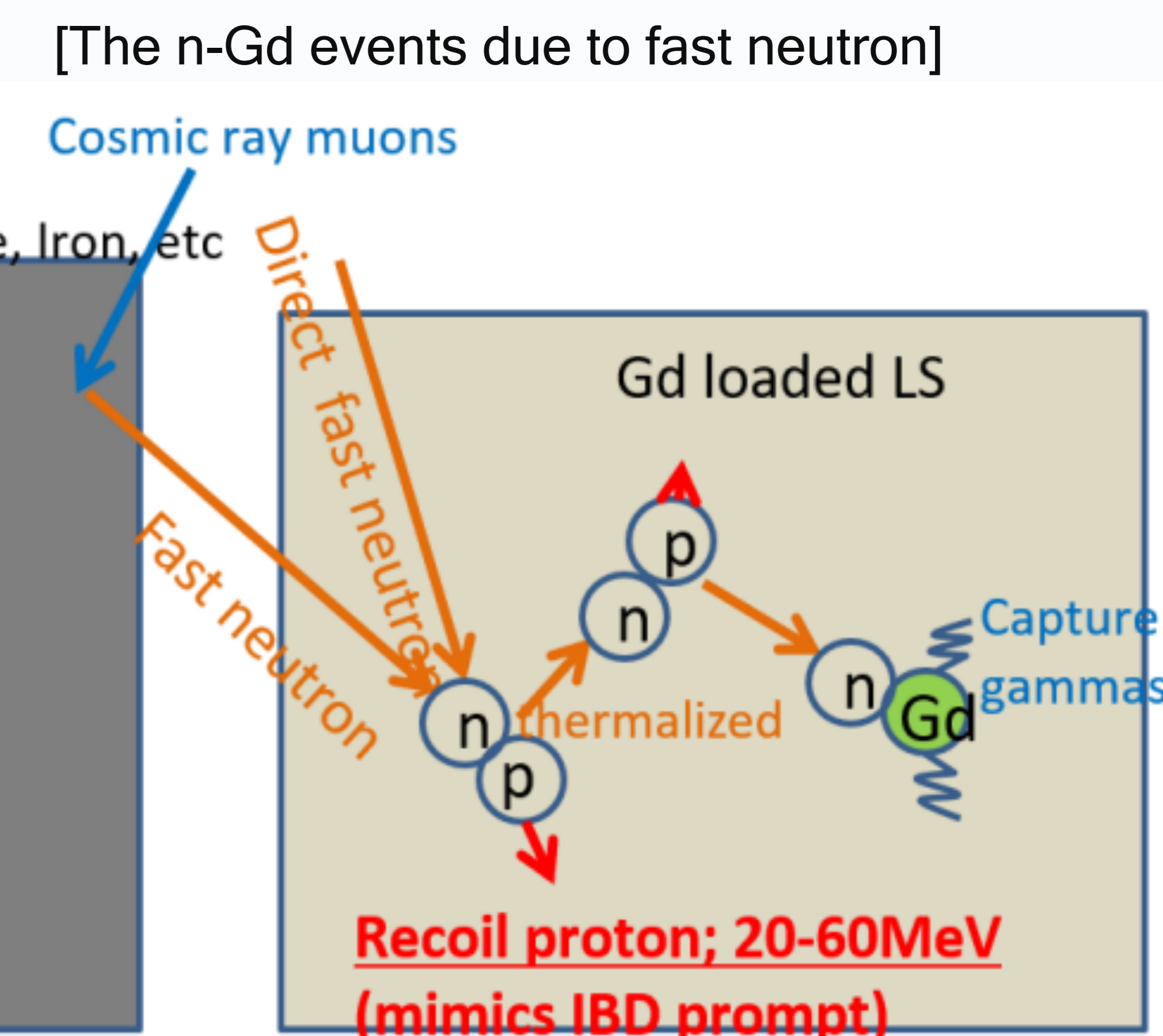
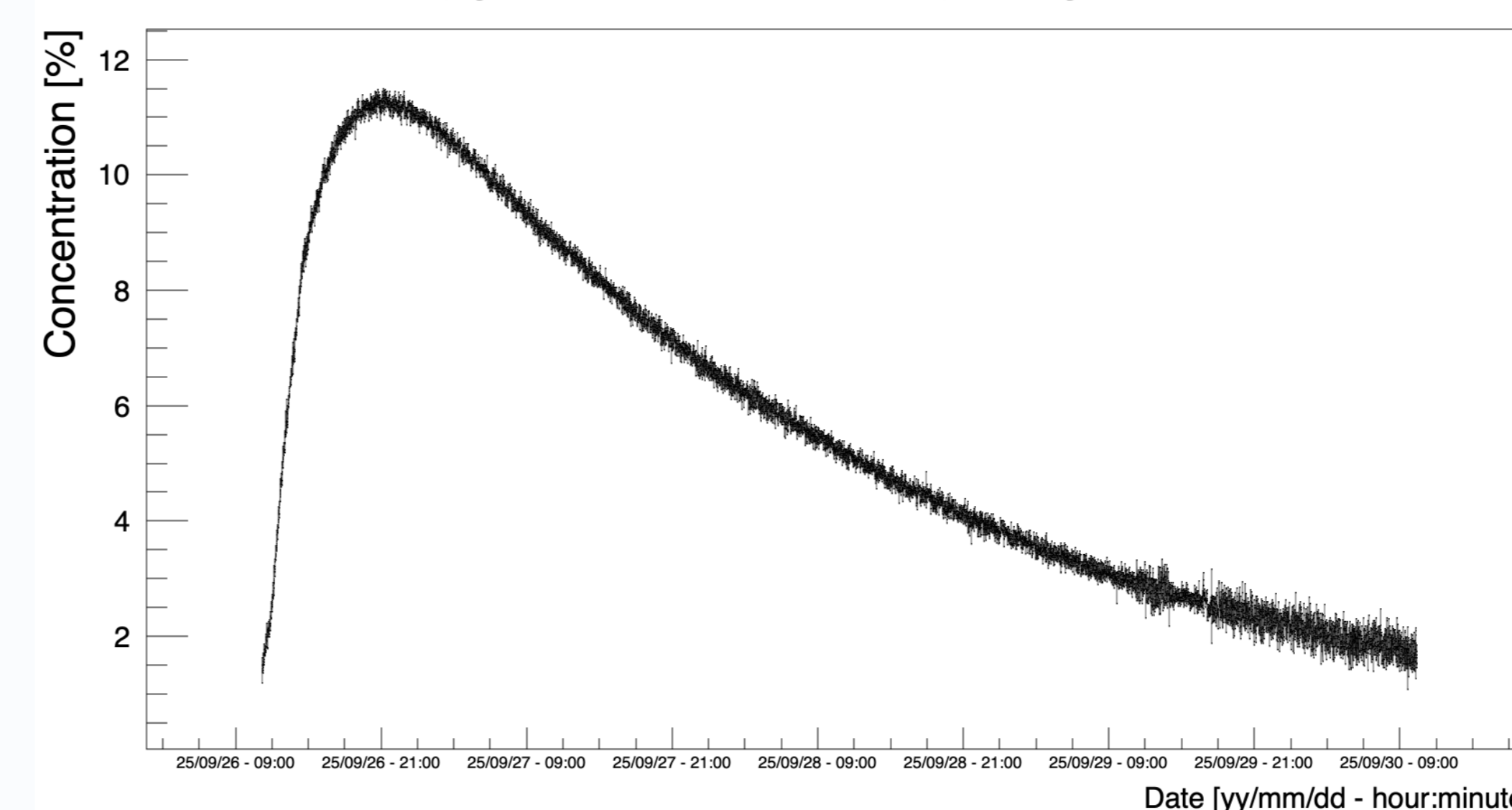
**Nitrogen purging of the Gd-LS**



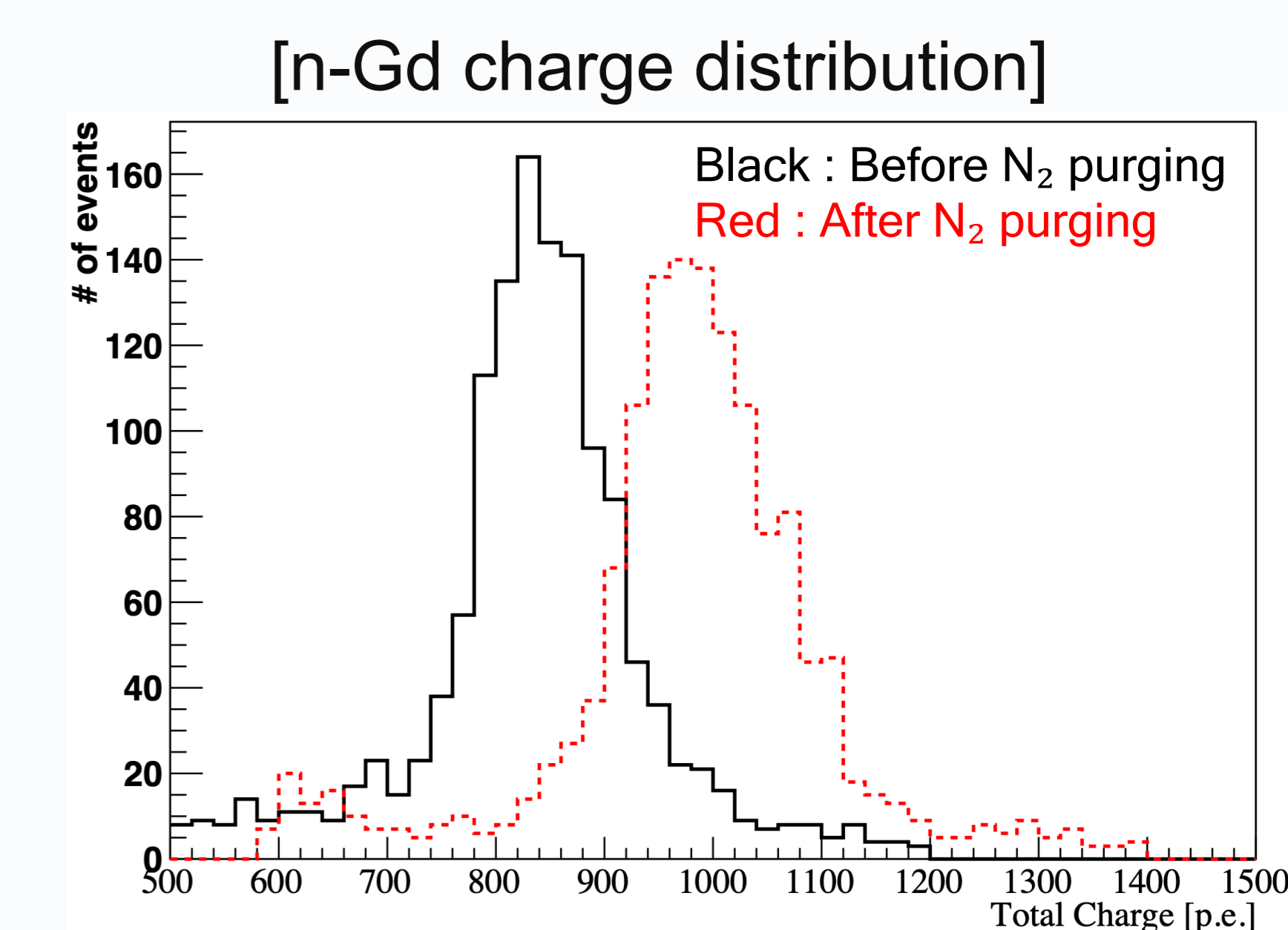
[Bubble on the Gd-LS during nitrogen purging]



Oxygen Concentration (by oxygen meter)



- Motivation
  - Remove dissolved oxygen from the Gd-LS
  - > Increase light yield & enhance energy resolution
- System design
  - N<sub>2</sub> bubbling system with PTFE pipes and connectors
- Result
  - Decrease in chimney oxygen meter values
  - 17% increase in total PMT charge after purging



**Summary & Plans**

- Level stabilizer system constructed for stable pure LS level maintenance
- Nitrogen purging performed to remove dissolved oxygen in Gd-LS
- Charge increase evaluated using the n-Gd peak from fast neutron events
- Detector commissioning ongoing toward physics data taking