Flash Talk:
A comparison of n-O inelastic scattering between the experimental and simulation models towards understanding neutrino reaction

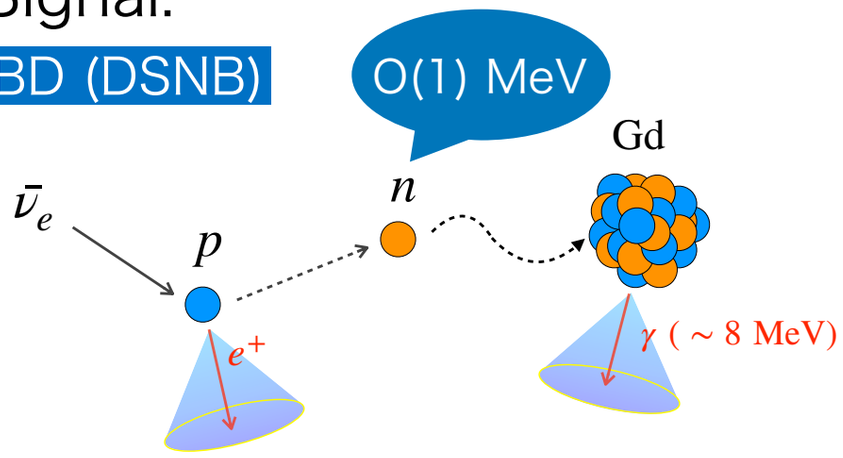
SNWS2024,
Feb. 29th - Mar. 1st, 2024
Okayama, Japan

Y. Hino
Okayama Univ.

Atm. ν-NCQE Reaction

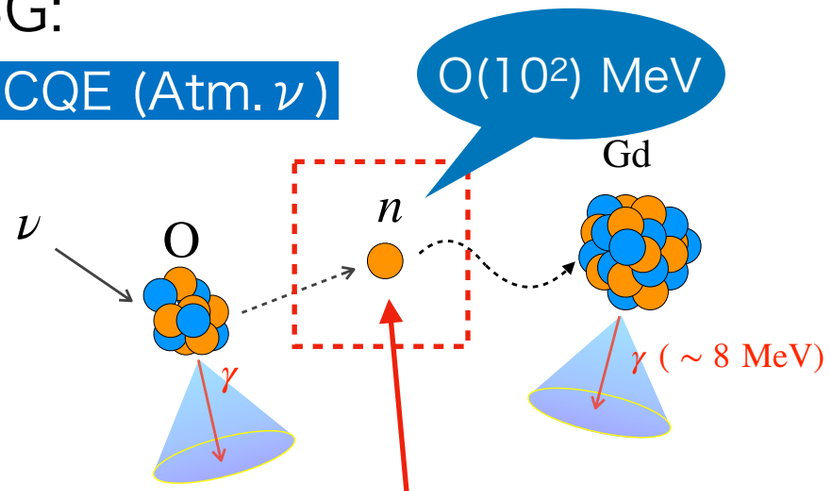
Signal:

IBD (DSNB)

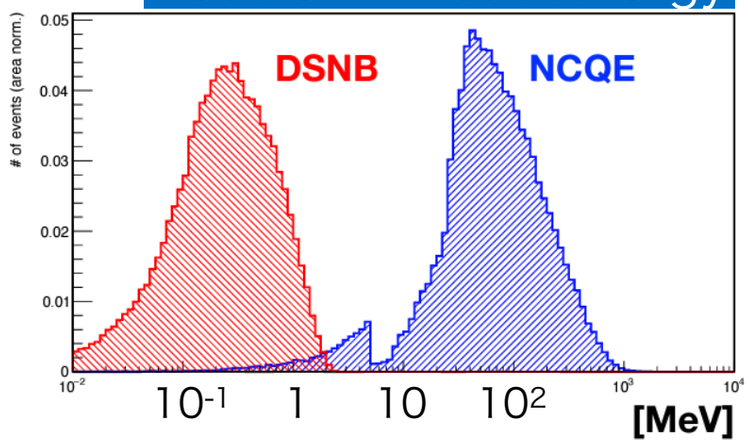


BG:

NCQE (Atm. ν)



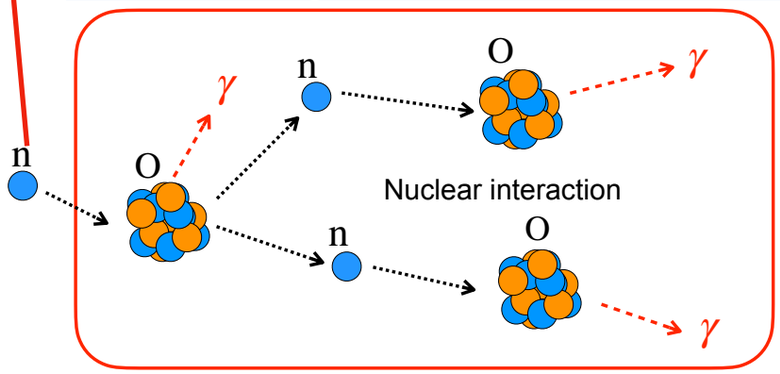
Neutron Kinetic Energy

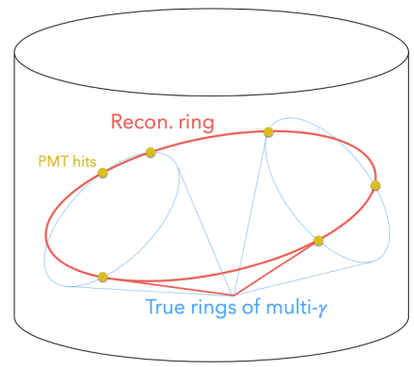


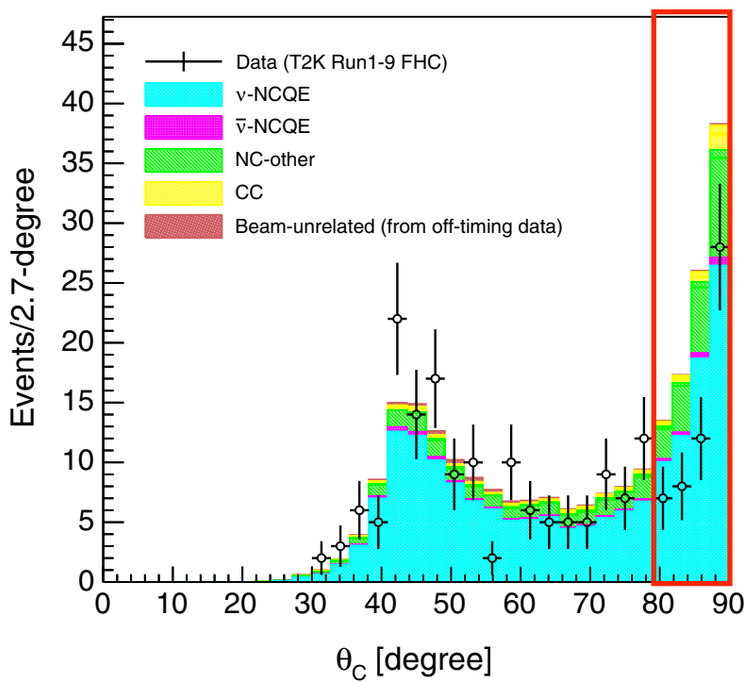
- Atm. ν-NCQE reaction mimics IBD reaction in a search for the signal of DSNB.
  - 30 - 60% uncertainty assigned due to neutron secondary interaction in water.
- NCQE XS measurement using the T2K beam.
  - Observed discrepancy b/w data and MC in the large Cherenkov angle region.
    -> indicated bad prediction using inappropriate n-O interaction model

=> **n-O reaction measurement!**

Secondary interaction in water



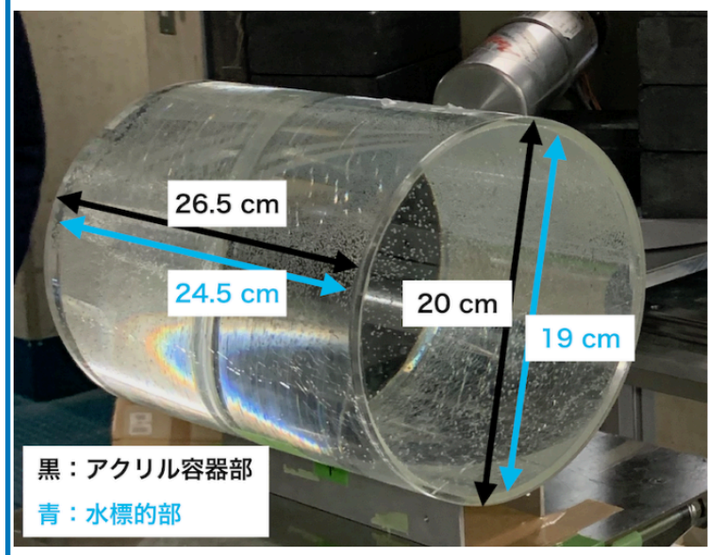


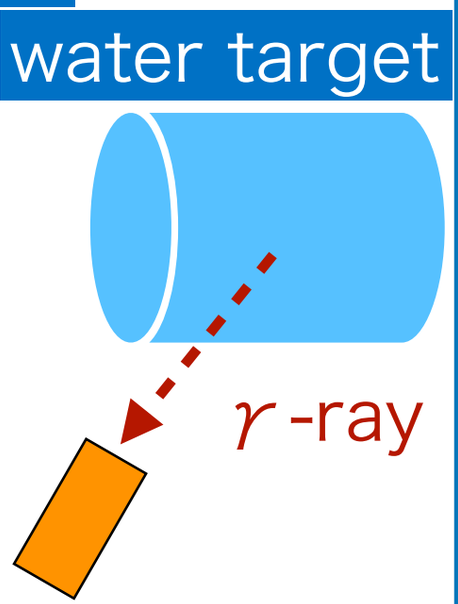


Experiment vs Simulation

Experiment: E525@RCNP

n beam (30, 250 MeV)

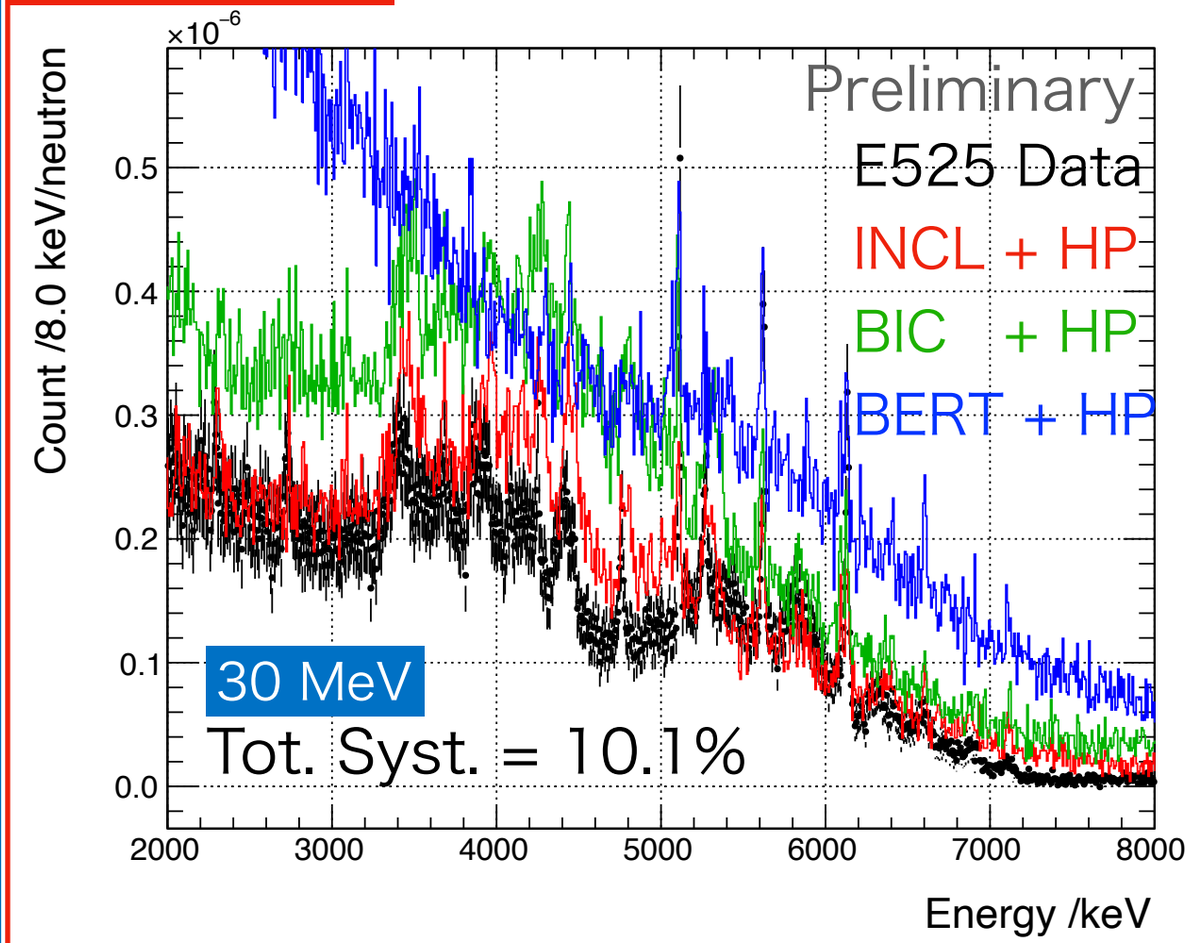




Ge Detector

-> gamma-ray detection

Simulation Geant4.10.5.1



- MC simulation to compare with the result from E525.
- We used the following models available in Geant4:
  - Liege Intranuclear Cascade (INCL++) => better prediction!
  - Binary Cascade (BIC)
  - Bertini Cascade (BERT) <- Current choice in the SK simulation.

Backups