



# Katabuchi Laboratory

Study on nuclear reactions using neutron beam and its application

Laboratory for Zero-Carbon Energy

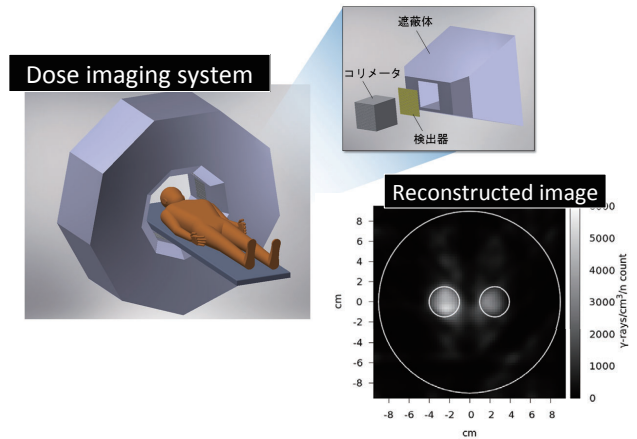
<http://www.zc.iir.titech.ac.jp/~buchi/>

- Study on neutron nuclear reactions for nuclear engineering
- Development of online dose imaging system for boron neutron capture therapy
- Study on neutron nuclear reactions for nucleosynthesis

Neutron-induced nuclear reactions are important for nuclear engineering. We study nuclear reactions using neutron beams produced with particle accelerators.

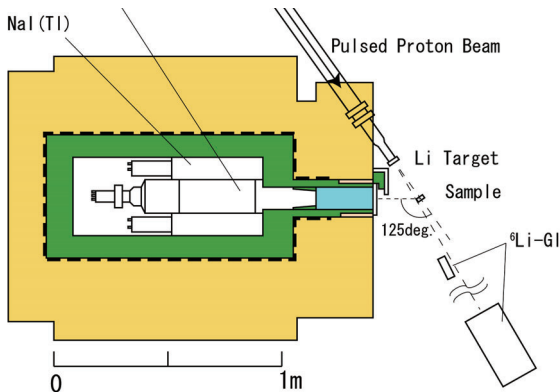
In experiments, we detect neutrons and  $\gamma$ -rays with radiation detectors. Thus, we work on development of radiation detection technology. Experiments are made using both a Tokyo Tech accelerator and J-PARC in Tokai, Ibaraki.

Nuclear reaction data of long-lived nuclides important for study on nuclear transmutation, were measured. Development of online dose imaging system for boron neutron capture therapy (BNCT) is also ongoing.



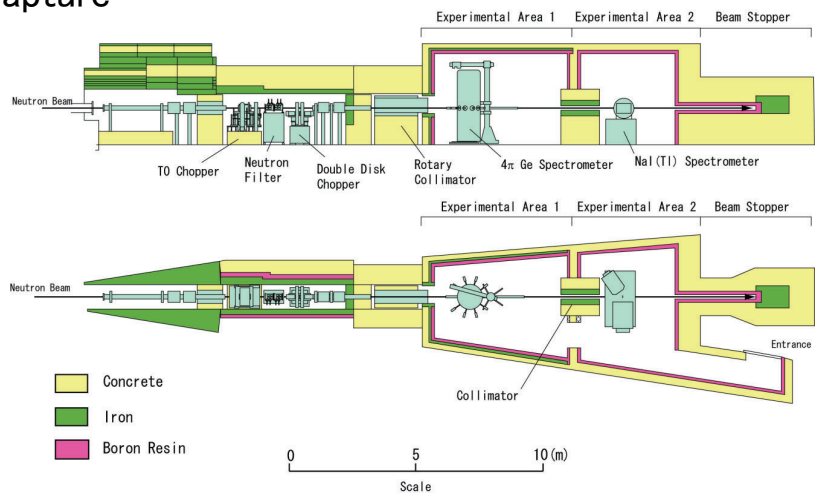
Online dose imaging system for BNCT

- Patient dose evaluation during irradiation
- Test experiments carried out with a neutron beam
- Reconstructed image obtained in test (right-bottom)



Tokyo Tech neutron beam experimental setup

- Neutrons produced using a Pelletron accelerator
- Neutron time-of-flight using a pulsed neutron beam
- Accurate neutron cross section measurement achieved with a large Nal(Tl) detector



ANNRI – Accurate Neutron Nucleus Reaction Measurement Instrument

- Neutron beam line for nuclear data measurement in J-PARC
- Intense pulsed-neutron beam allowing measurement that was difficult before
- Tokyo Tech group participated the ANNRI project from the beginning of construction.