

## Transition from nucleus to medicine

*Tuesday, 7 March 2023 17:00 (30 minutes)*

Medical physics is a translational research field that applies knowledge and technologies developed in basic sciences and other fields to medicine. Major medical physics research topics are the evaluation of the performance of newly imported techniques and the development of new medical systems and devices. While the typical goal of medical physics is to establish clinically available systems, these systems have a potential risk of malfunction due to unresolved mechanisms. To explore the exact characteristics of such unresolved mechanisms, I have been working on a relationship between cause and effect in the quality assurance system used in radiotherapy clinical practices. In this presentation, I will introduce the prediction of gamma passing rate, a score of similarity of two dose distributions, using an ab initio-type approach [1,2]. I will also introduce the application of the event-mixing technique to evaluate the predicted gamma passing rate, the automatic calibration of an arbitrarily-set near-infrared camera system is also introduced in the presentation [3,4], and the development of the in-air readout optical computed tomography for gel dosimetry for radiotherapy.

[1] E Shiba, A Saito *et al*, *Medical Physics* **46**, 999–1005 (2019).

[2] E Shiba, A Saito *et al*, *Medical Physics* **47**, 1349–1356 (2020).

[3] A Saito *et al*, *Medical Physics* **46**, 1163–1174 (2019).

[4] A Ohashi, T Nishio, A Saito *et al*, *Physical and Engineering Sciences in Medicine* **45**, 143–155 (2022).

### Experimental study on nuclear physics

**Primary author:** SAITO, Akito (Hiroshima University)

**Presenter:** SAITO, Akito (Hiroshima University)

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