

# TAMAO SAKAO

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## The Registration Plan for GPPU (Doctor Course)

### 国際講義 / International Lecture

- 宇宙創成物理学特殊講義 I: I'll attend to the next SNP school.

### 高度実験 / Advanced Experiment

- 宇宙創成物理学高度実験: **10 GEPs remain to earn.** I'll take three courses from M2 course.  
3 GEPs, already earned. (FPGA training course, 2019)

### 博士研修 / Doctor Training

- 宇宙創成物理学特別国際研修:

My outlook for the international training of GPPU is visiting Ohio University and Jefferson Laboratory to learn the analysis method of CLAS and do  $\Lambda$ d scattering analysis with their experimental data.

Using the  $\gamma p \rightarrow K^+ \Lambda$  reaction, CLAS observes the hadronic resonance at Hall B of Jefferson Lab in the USA. One of their experimental data, "g10" data, has been put to the use of CLAS data on a deuterium target to measure a different photoproduction cross-section. In the measurement, we could also look at events where the bound deuteron is detected by CLAS, for the reaction:  $\Lambda d \rightarrow \Lambda d$  (elastic scattering). Thanks to Prof. Kenneth Hicks, who kindly accepted our request, a remotely operated analysis on that event will be possible once the professor gives us ROOT files via his analysis platform. Plus, the additional analysis workshop is available online using Zoom or Skype so that we won't need to concern about the COVID-19 pandemic impact on the GPPU required number of international training days.

- 博士研修 (現行) :

#### (1) J-PARC E40 Data Analysis 1 ( $\Lambda p$ Scattering Identification)

E40 experiment was just set for  $\Sigma p$  scattering, not  $\Lambda p$  scattering. Its data includes  $\Lambda$  production by the  $\pi^- p \rightarrow K^0 \Lambda$  reaction as a byproduct. This produced  $\Lambda$  collides with a proton in LH2 target generating  $\Lambda p$  scattering event, then decays to  $\pi^-$  and proton. I'll analyze the particles in the final state using kinematical analysis methods.

#### (2) New $\pi^-$ Beam Position Detector Design, Development and Test

To improve the accuracy of  $K^0$  identification.

#### (3) J-PARC E40 Data Analysis 2 ( $\Lambda p$ scattering cross-section calculation)