

Oral Content

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Good morning. I'm Yuto Kimura. The title is Detail Measurement of a Kaonic Nuclei " K^-ppn ". Kaonic nuclei is a bound state between \bar{K} and N . My big goal is to understand the property of kaonic nuclei by systematic research. Only " K^-pp " was confirmed now. So, I want to confirm next kaonic nuclei " K^-ppn ". What is speciality in kaonic nuclei? It is formed by very strong attractive $\bar{K}N$ interaction. And there is no Pauli exclusion principle between \bar{K} and N . Therefore, I think nucleons should be easy to feel \bar{K} as a impurity. And the system is expected to drastically change. Actually a few years ago, the J-PARC E15 experiment resulted in that " K^-pp " has 50 MeV binding energy. It is much bigger than proton-proton system and deuteron. This result suggests we can make high dense matter by adding \bar{K} in nucleon system.

That's why I want to know about another kaonic nuclei.

We plan J-PARC E80 experiment to confirm " K^-ppn ". This is a picture of the reaction we will use. Comparing to E15 case, the decay particles increase, and they include neutron. So we need the new detector system "DOLAMI" which has larger acceptance and better capability to detect neutrons. I contribute to two detectors in DOLAMI; Cylindrical Neutron Counter and Cylindrical Drift Chamber.

This slide shows what I've done and what I want to do.

Last year, I've done the test experiment evaluating the time resolution of CNC which is a plastic scintillator with length of 2.6 m. I leded this test experiment from building frame and jigs to analysis and results presentation. I discussed it in jps meeting and a international school. Also, I leded J-PARC E73 as a core member. I worked a lot. But let me skip about this in detail here. Now, I conduct study of gas for CDC with old CDC. The analysis is ongoing. I'll discuss it in jps meeting next month. Then this is the new CDC with 8244 wires which have length of 2.8 m. Now I'm connecting 6428 daisy-chain cables each other by hand to supply high voltage. It's very tough work. After finishing that, I'll take cosmic ray data to check the performance of CDC.

From next year, I will do CDC comissioning and finalize CNC. In pararel, I want to go to DAFNE in Italy as my oversea project. In 2026, we'll prepare for E80. Finally, we'll complete E80 experiment and confirm a new Kaonic nuclei " K^-ppn ".

As a summary, through the GP-PU, I want to improve English communication skill with foreign researchers, and get leadership skills to lead a international group in the future to contribute to deeper understanding about our universe.

That's all. Thank you.
