

# Knowledge on doubly-strange hypernuclei and experimental prospect

*Monday, 26 June 2023 10:30 (30 minutes)*

The interaction energy between  $\Lambda$ ; hyperons and the presence or absence of  $\Xi$ ; hypernuclei (is  $\Xi$ ; hyperons bound to the nuclei?), which can be obtained from doubly-strange hypernuclei, are essential information for a unified understanding of baryons under  $SU(3)_f$  symmetry. Especially in recent years, they are also valuable information for understanding the existence of neutron stars. Over the past 40 years, doubly-strange hypernucleus search experiments have been conducted in Japan using nuclear emulsion, and 47 samples of doubly-strange hypernuclei have been detected. From the double- $\Lambda$ ; hypernuclei, we know that the  $\Lambda$ - $\Lambda$ ; interaction between two  $\Lambda$ ; hyperons is weakly attractive and that the binding energy of two  $\Lambda$ ; hyperons by the nucleus seems to depend linearly on the nuclear mass number. In addition, the  $\Xi$ ; hypernucleus does indeed exist, the attraction between  $\Xi$ ; hyperon and nucleon works, and the level structure of the  $^{15}_{\Xi}C$  hypernucleus can now be inferred. Efforts are being made to further explore the entire emulsion volume to dramatically improve the number of the samples of doubly-strange hypernuclei.

## Collaboration

KEK-E176, E373, J-PARC E07, and Emulsion-ML

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**Session Classification:** Plenary session