Study of light hypernuclei in the WASA@FRS experiment

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A call for a PhD contract is open at IEM (CSIC - Madrid) in the framework TALENTO-CM. It is funded by “Atracción de Talento Investigador” grant 2019-T1/TIC-13194 awarded by Comunidad de Madrid.
The proposed PhD thesis will be performed within the international SuperFRS experimental collaboration for the WASA@FRS experiment. The goal of the research project is to study unknown exotic hypernuclei. In addition to the standard nuclear matter composed by ordinary nucleons, formed by triplets of the down and up quarks, the strange quark is necessarily considered in order to understand the properties of the dense matter. The study of the strangeness production in nuclear collisions aims to understand the role of the s-quark in dense matter.

The experiment is planned to use the WASA detector system at the fragment separator FRS of the GSI-FAIR facility in Darmstadt (Germany) to study light hypernuclei produced in the ion-induced reaction at relativistic energy. The objectives of the proposed thesis titled “*Study of light hypernuclei in the WASA@FRS experiment*” is the improvement of spectroscopy through deep learning techniques. The main physics topic of the thesis will be the analysis of the two-body decay of the light hypernuclei, H3Λ H4Λ or nnΛ, measured during WASA@FRS experiment.

With the upcoming experiment, the proposed work for the endowed PhD student will revolve around several topics:

- Involvement in the development of innovative methods in deep learning.
- Contribution to the data analysis development.
- Participation in the development of a detector prototype.
- Engagement in the analysis of the obtained experimental data after the completion of the experiment. Its results will be the most important part of his/her PhD thesis.

The duration of the PhD position is 3 years. During that time, the PhD student will be:

- To manage and carry through his/her research project.
- To write scientific articles and his/her PhD thesis.
- To disseminate his/her research orally in seminars and other oral contributions.

The position is fully funded. The selected student will receive an attractive monthly salary as well as travel funds for research visits and conferences.

The starting date is expected to be September 01, 2020. Applications are fully considered until June 30, 2020. Then late applications will be considered until the position is filled.
Application requirements:
The candidate must have:

- Successfully completed a scientific study of physics and obtained a Master of Science in nuclear physics or equivalent.
- Experience in experimental nuclear physics, in statistics, and analytical skills are valued.
- Work during the master thesis in experimental physics is preferable, but is not a requirement.
- Computer literacy in C++ or python.
- Good communication skills in the English language.
- Willingness to work in an international environment, including stays at GSI, are expected.

Interested candidates should send to christophe.rappold@csic.es

- Cover letter, (your motivation and background for applying for this PhD position, 1 page)
- Short CV, (include a list of your publications here, if applicable)
- Contact details of at least two persons that could be requested for references
- Transcript of academic records, (please indicate the grading system if it is not evident from the transcripts)

Informal inquiries should be sent to: christophe.rappold@csic.es