

## Determination of the Hypertriton matter radius using HYDRA TPC

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HYDRA (HYpernuclei Decay at R3B Apparatus) is a physics program within the R3B collaboration at the decay spectroscopy of hypernuclei produced from heavy-ion collisions at GSI/FAIR. The program aims at measuring with high resolution the in-flight pionic decay of light and medium mass hypernuclei. The pion tracker is conceived as a time projection chamber (TPC) inside the GLAD magnet of the R3B setup. As a first step, a prototype TPC was built to implement all the technologies proposed for the full TPC.

The full experimental setup has been simulated within the R3BROOT framework. Simulations were used to optimise the geometry and to define conditions for a forthcoming experiment at GSI/FAIR. Results will be detailed. The first experiment to be proposed with the HYDRA prototype, aiming at the matter radius of hypernuclei such as the hypertriton, expected to be halo, from interaction cross section (ICS) measurement. Hypernuclei have a very short lifetime ( $\sim 200$ ps) and direct measurement of their ICS is difficult. Therefore, to determine the ICS measurements of the mesonic decay vertex distribution of the hypernuclei will be performed.

This talk will provide an overview of the HYDRA physics program and a description of the experimental method to be used to determine the hypertriton matter radius.

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