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## Heavy $\Xi^-$ hyperatoms at $\bar{\text{P}}\text{ANDA}$

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In the course of its full lifetime  $\bar{\text{P}}\text{ANDA}$  at FAIR will address the physics of strange baryons with  $S=-2$  in nuclei by several novel and unique measurements. This series of experiments will start with the exclusive production of hyperon-antihyperon pairs close to their production threshold in antiproton-nucleus collisions. This day-one experiment offers a hitherto unexplored opportunity to elucidate the behaviour of antihyperons in nuclei. Within its intermediate stage  $\bar{\text{P}}\text{ANDA}$  will offer the unique possibility to search for X-rays from very heavy hyperatoms as e.g.  $\Xi^-$ - $^{208}\text{Pb}$ . This will complement experiments at J-PARC which attempt to measure X-rays in medium-heavy nuclei. Finally,  $\bar{\text{P}}\text{ANDA}$  will extend the studies on double  $\Lambda$  hypernuclei by performing high resolution  $\gamma$ -spectroscopy of these nuclei for the first time.

This contribution will focus on the hyperatom experiment in all of its facets. Besides its dedicated detector components, the talk will present simulation studies for the expected event rates and how they influence the achievable precision in the estimation of the  $\Xi^-$ -nuclear potential. Since this estimation is strongly correlated with the shape of the nuclear periphery of the  $^{208}\text{Pb}$  nucleus, the systematic uncertainty inherited by the neutron skin thickness of  $^{208}\text{Pb}$  is also discussed.

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