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Hypernuclei and Ξ^- measurements in Ag+Ag Collisions at $\sqrt{S_{NN}}$ = 2.55 GeV with HADES

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In the scope of the FAIR Phase-0 physics program, the HADES collaboration recorded 13.7 billion Ag(1.58A GeV)+Ag events. With an available energy of 2.55 GeV in binary nucleon nucleon collisions, the lightest hadrons containing strangeness are produced at their free nucleon nucleon threshold energy. Therefore, they are ideal probes to investigate medium effects due to their steep excitation function.

In this contribution, we present preliminary results on the production and lifetime measurements of ${}^{3}_{\Lambda}$H and ${}^{4}_{\Lambda}$H hypernuclei which are reconstructed via their weak two-body decay channels ${}^{3}_{\Lambda}$H -> ^{3}He + π^- and ${}^{4}_{\Lambda}$H -> ^{4}He + π^-. The separation of signals from the combinatorial background is based on the observed weak decay topologies evaluated with the help of an artificial neural network (ANN). For both hypernuclei a lifetime measurement with sophisticated systematic uncertainty estimations is performed to contribute to the world data of hypernuclei lifetimes. Furthermore, we present measurements of multi-strange hyperons which are produced far below their free nucleon nucleon threshold energy and reconstructed using similar analysis techniques. All presented results are discussed with respect to the available world data.

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