

Studies of multi strange systems at PANDA

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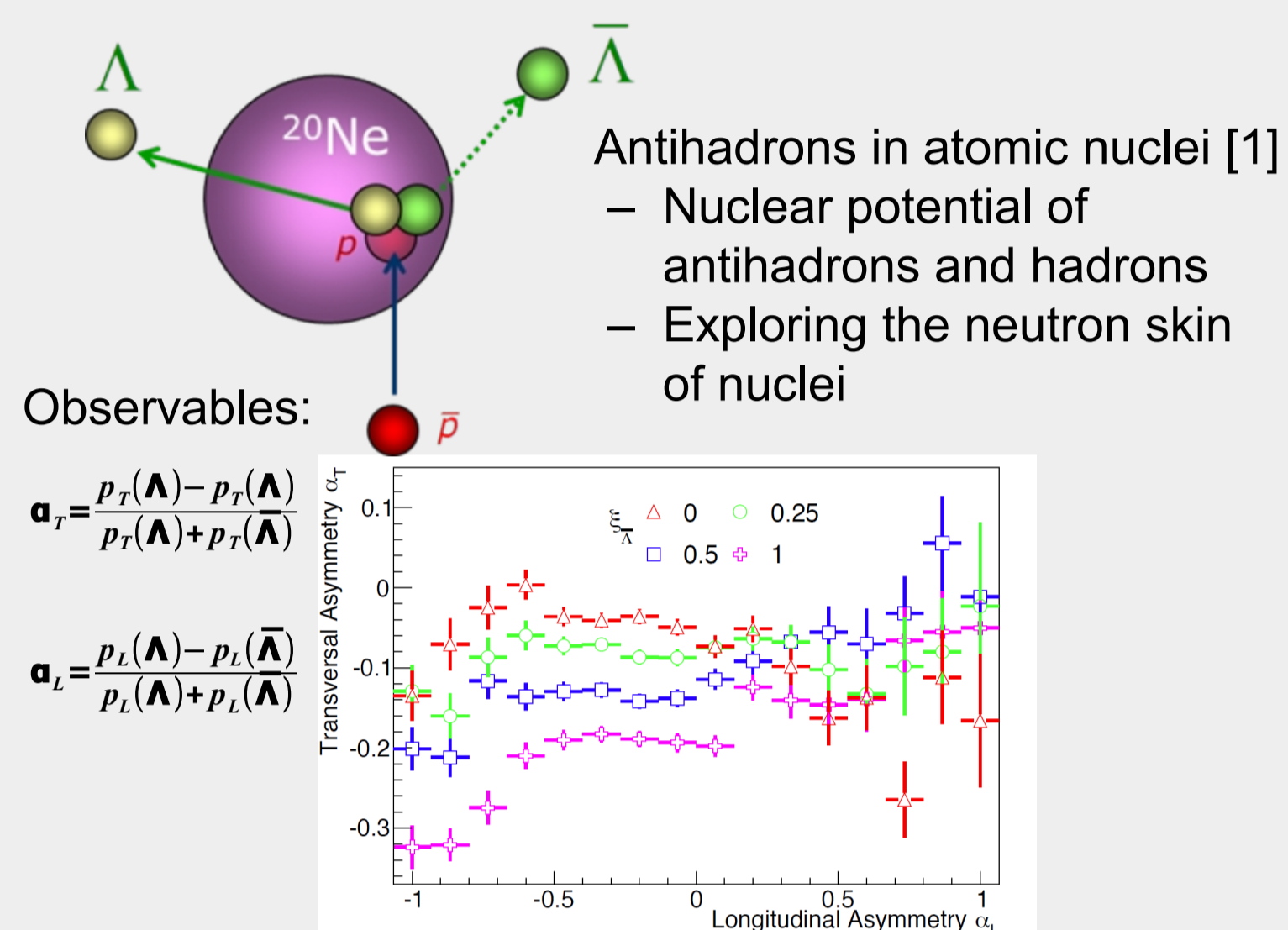


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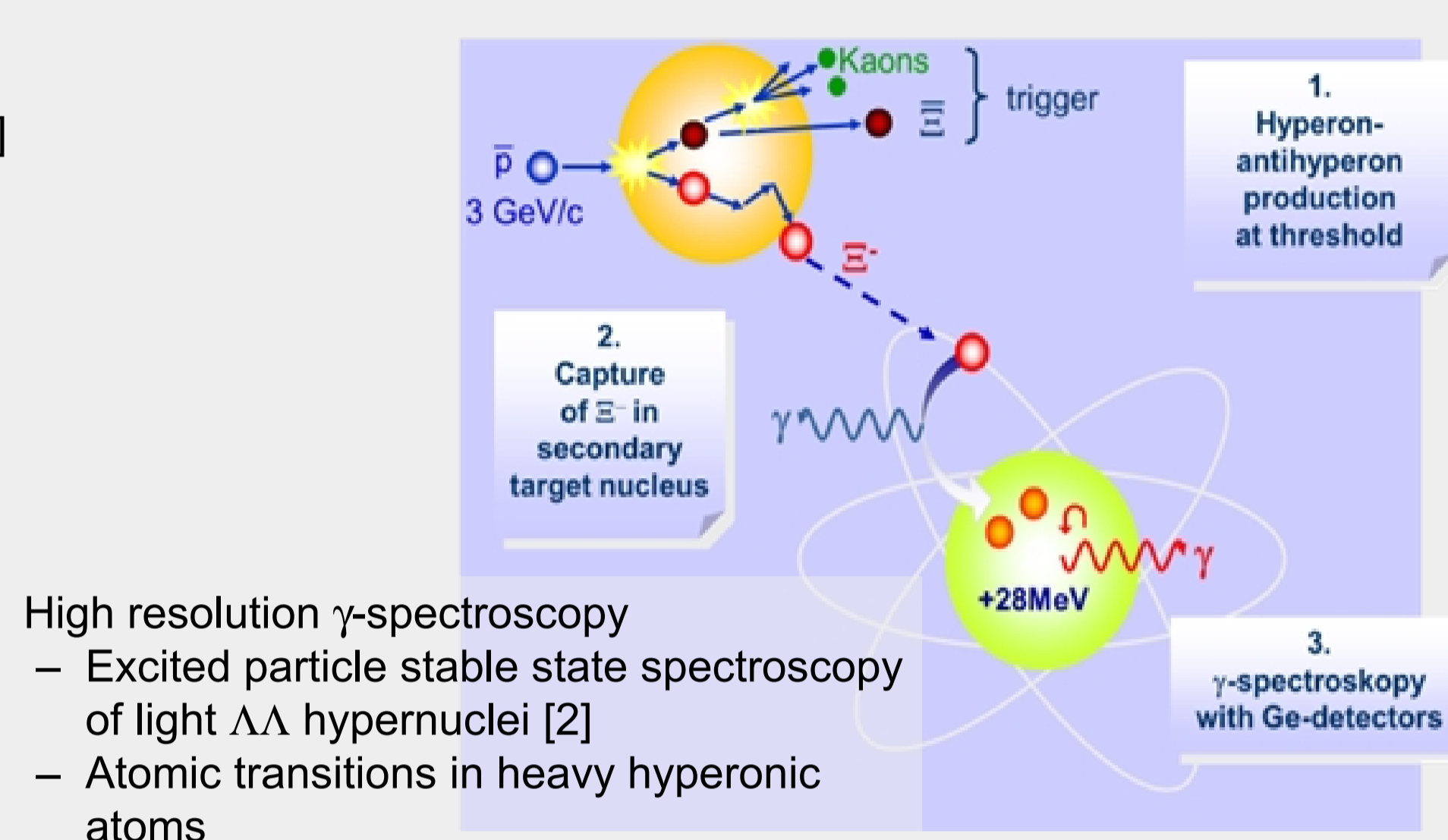


Exploring (anti-) hadron interaction

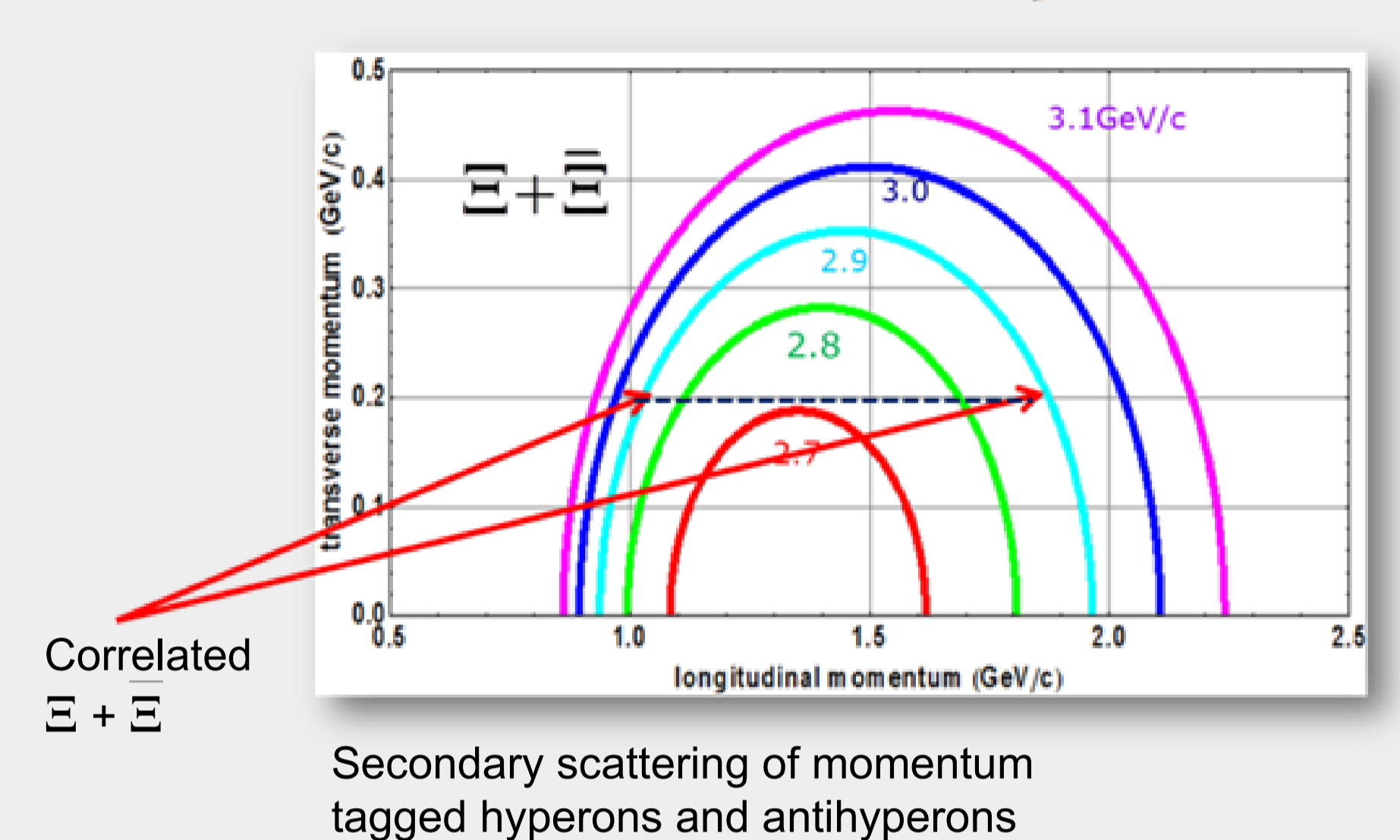
Childhood



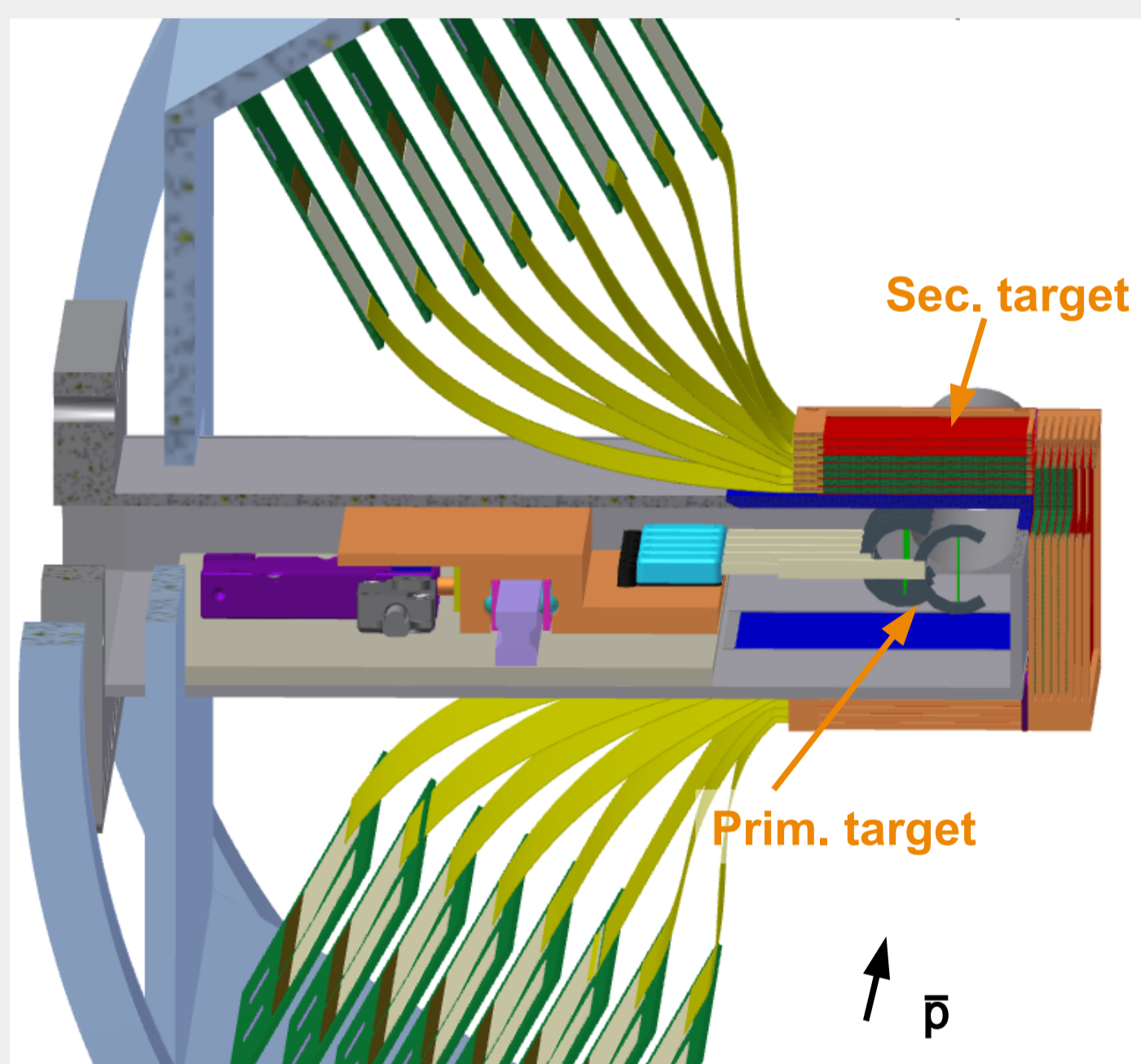
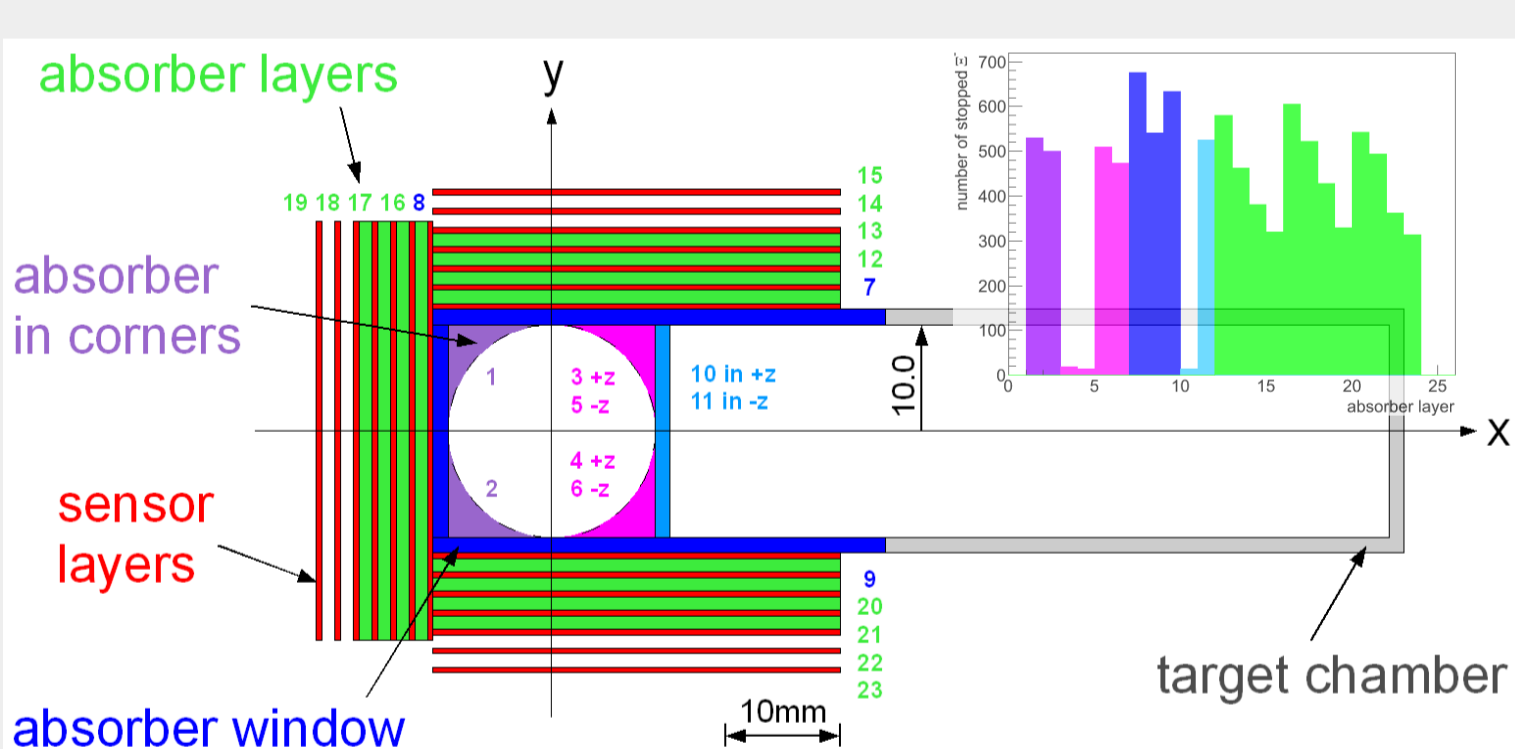
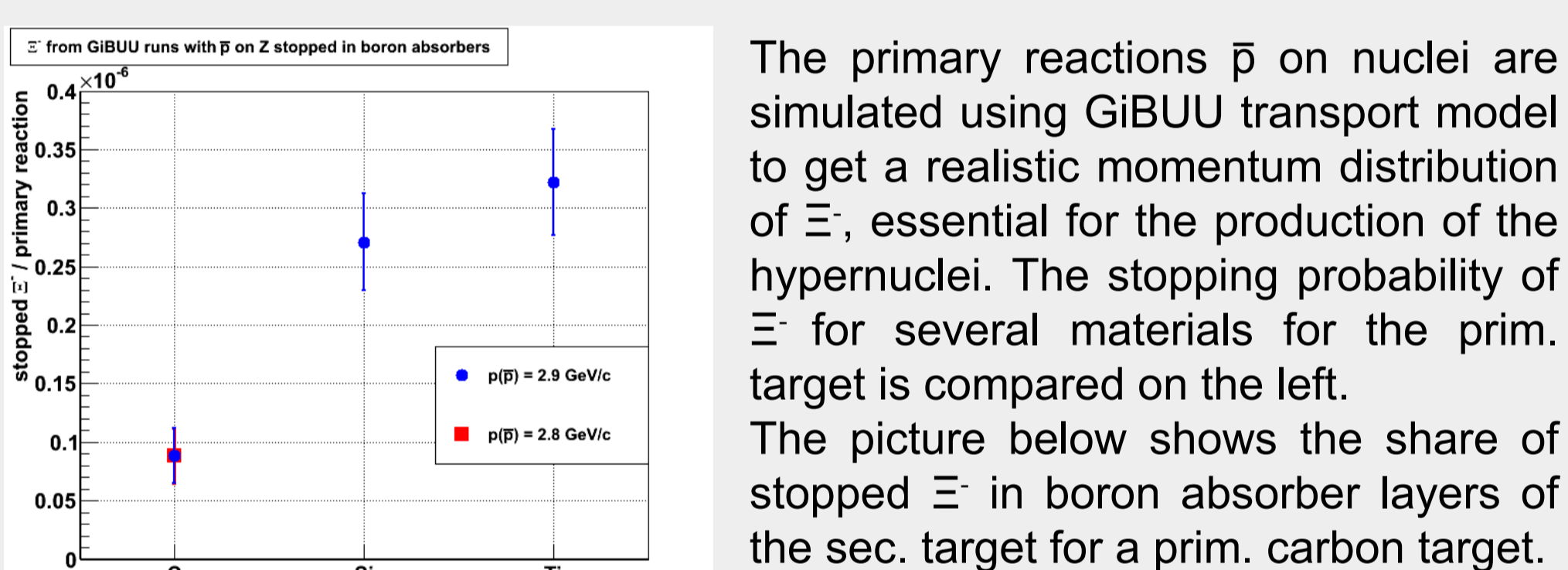
Adolescence



Adulthood



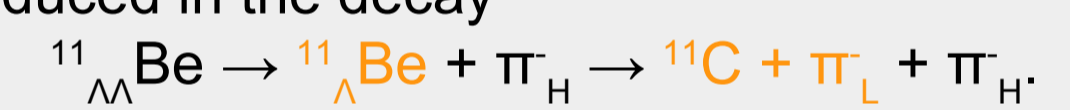
Optimization of the hypernuclei production



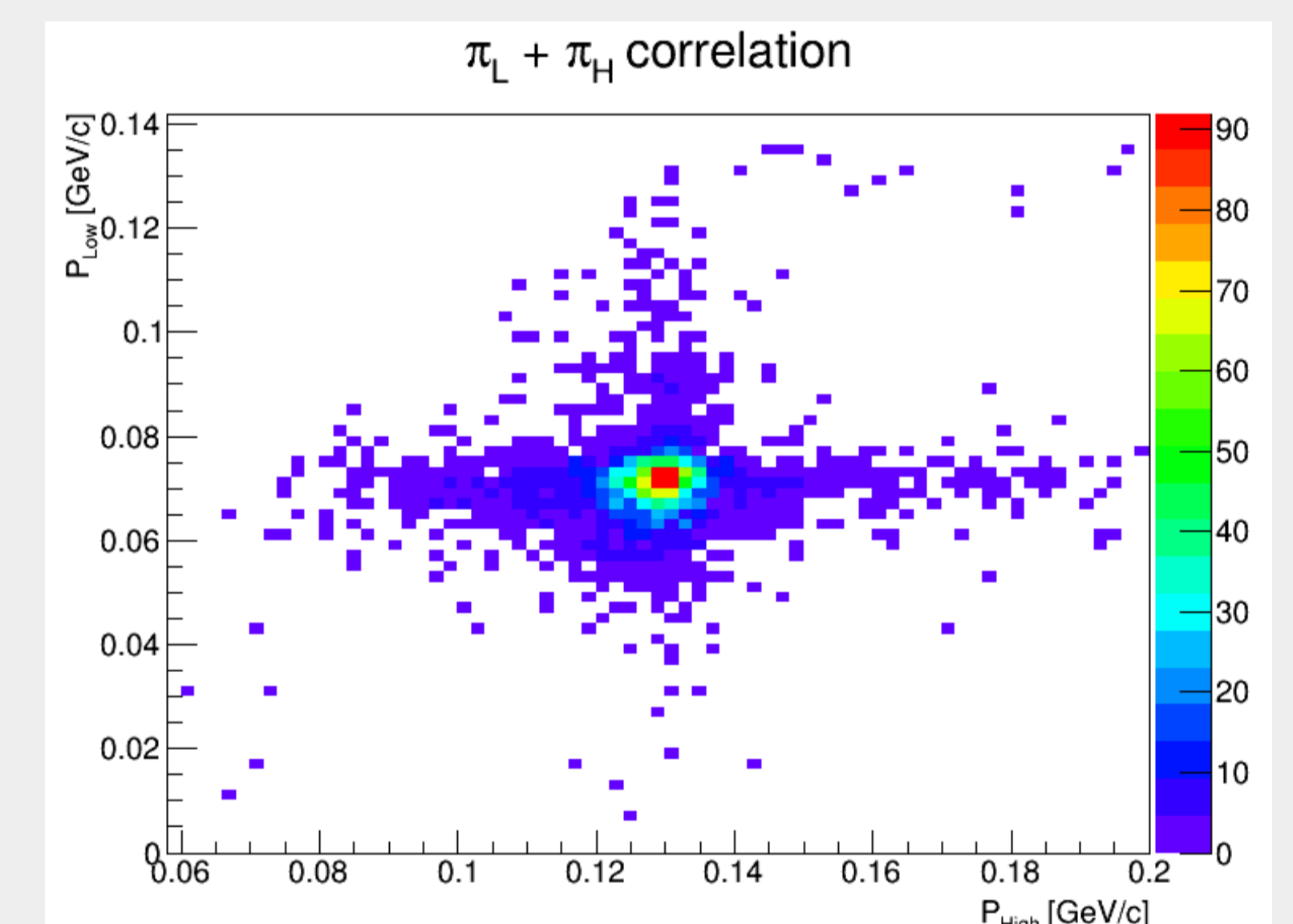
Look inside the target chamber with the magazine of spare primary targets and the sandwich structure of absorbers and Si detectors of the sec. target. For the detection of hyper atoms the geometry of the secondary target will be modified.

Optimization of the hypernuclei identification

In addition to the production of hypernuclei, the active part of the secondary target is used for the tracking of low momentum pions. The figure below shows the correlation of the two pions that are produced in the decay

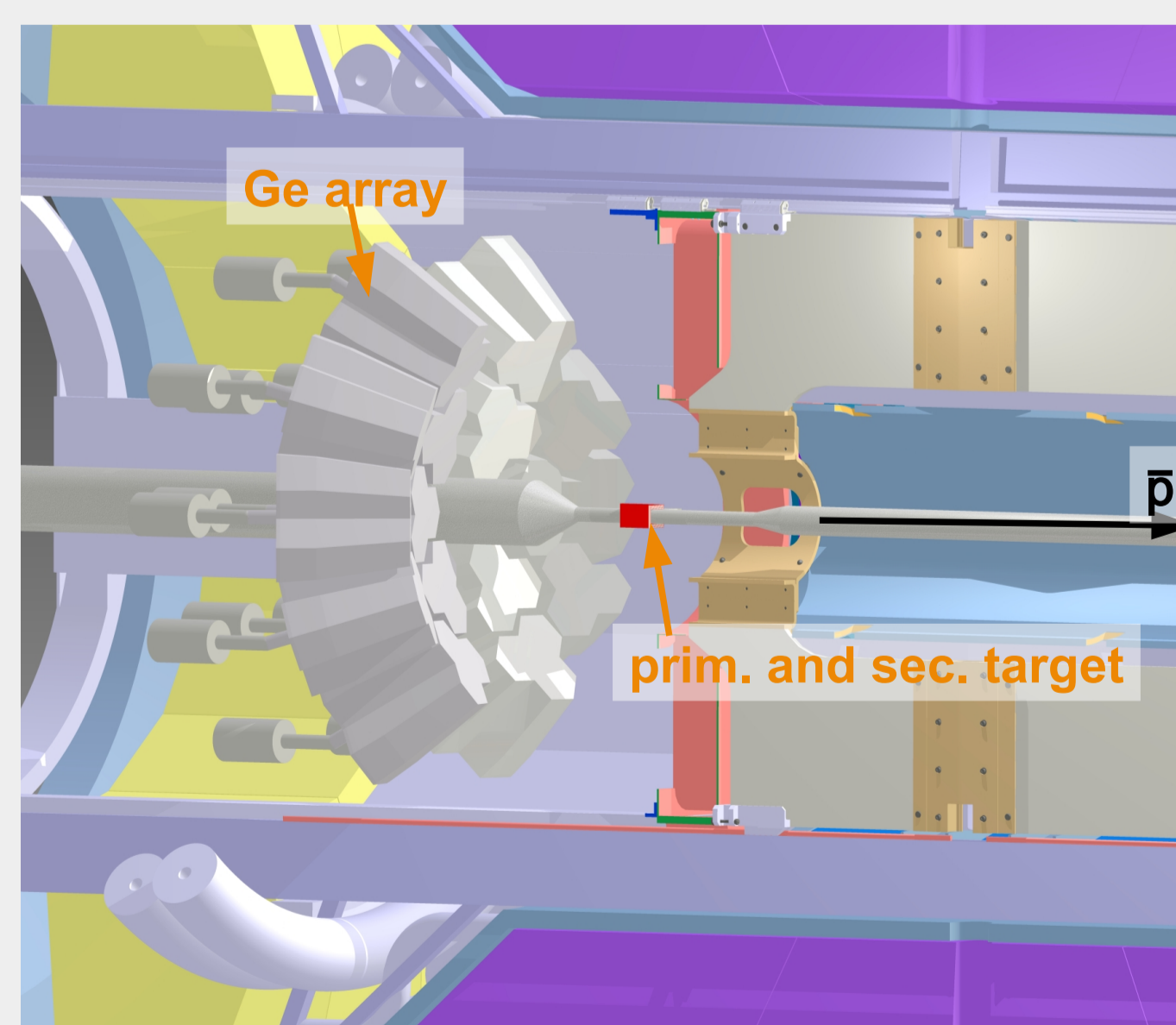
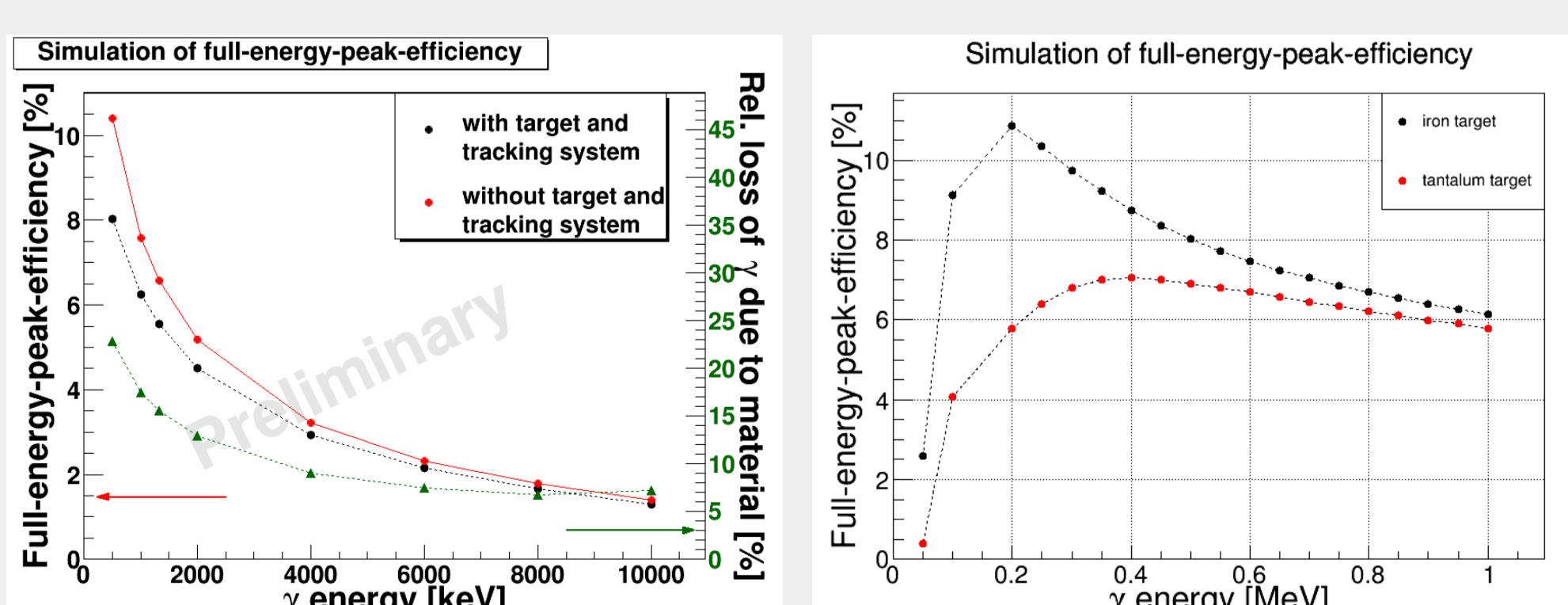


The efficiency for a correlated detection of both pions is 33 %.



Influence of the target system on the γ detection

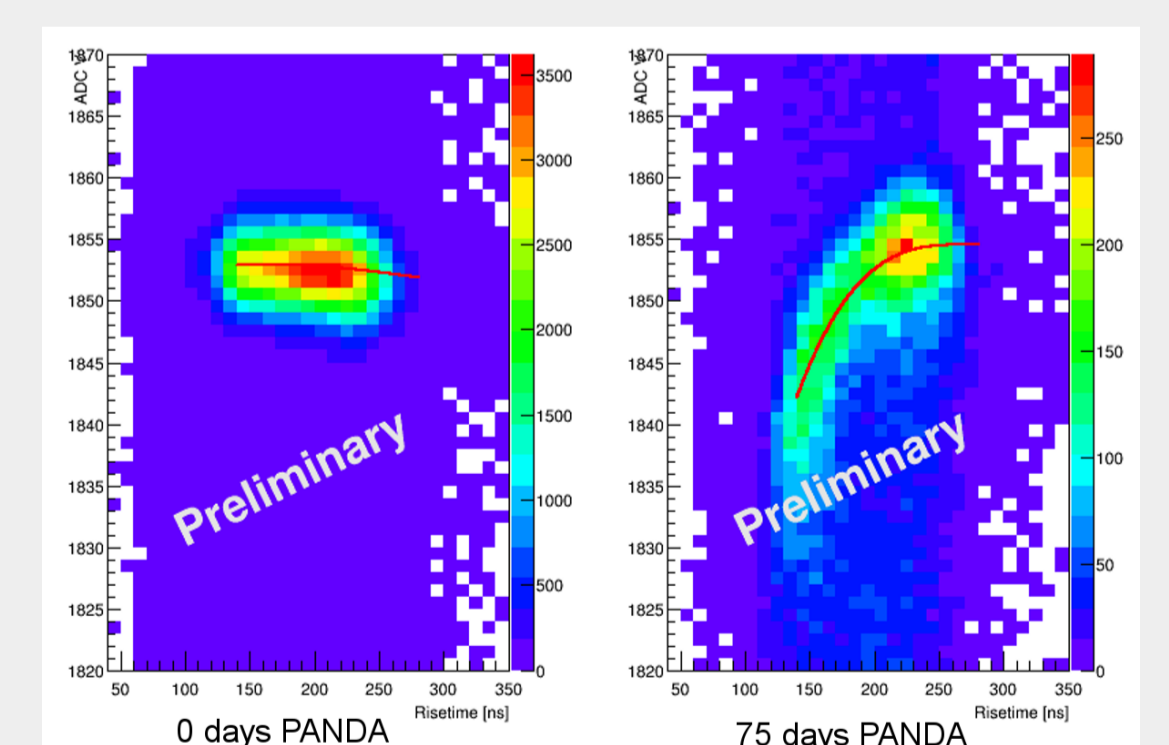
Besides the production and tracking efficiency of the target, it is important that its influence on the detection of the γ is minimized. Studies of this are done using the PANDARoot framework. These studies show a sizable absorption by the target system. Especially low energy γ are strongly absorbed and still 7 % of 10 MeV photons are affected by the target material (below, left picture). Photons with an energy lower than 1 MeV are used to improve the layout and the material of the target system for the hyper atomic experiment. First studies show reasonable values for the detection efficiency even with heavier target materials (below, right picture).



Integration of dedicated detectors inside the PANDA barrel spectrometer to study $\Lambda\Lambda$ hypernuclei.

Irradiation damage studies

The high hadronic background inside the PANDA spectrometer damages the germanium crystals. Therefore irradiation tests at COSY have been performed. The digitization of pulse shapes allows the appliance of digital filters offline. The picture on the right shows the correlation of risetime and energy at the beginning and the end of the beam time.



Using this result a correction of the measured energy is possible. The plots show the enhanced resolution of the 1332 keV line of ${}^{60}\text{Co}$ by applying the correction algorithm.

