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Advancements in Hyperon Tracking with the PANDA Detector Using Geometric Deep Learning

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Due to their comparatively long lifetimes, hyperons decay at macroscopic distances from the primary interaction point in particle collider experiments. Because of these displaced decay vertices, the efficient and accurate reconstruction of their daughter particles has remained a long-standing challenge. In a previous work, geometric deep learning was successfully used to reconstruct simulated Λ hyperons with part of the straw tube tracker of the PANDA experiment. Building on this work, the project presented here applies the same method to the reconstruction of Ξ hyperons and aims at improving the computational and tracking performance of the software.

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