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Machine Learning for FARICH Reconstruction in the SPD experiment at NICA

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A Focusing Aerogel RICH detector (FARICH) detector is a valuable component of the particle identification system in the SPD experiment, improving the separation of pions and kaons in final open charmonia states (momenta below 5 GeV/c). High event rate resulting from a free-running (triggerless) data acquisition pipeline of the SPD necessitates the development of a rapid, robust software event reconstruction. In this contribution, we develop a Convolutional Neural Network (CNN)-based approach to FARICH reconstruction inspired by machine learning techniques from computer vision. The use of a flexible model trained in an end-to-end fashion allows for a more complete utilization of the input data, achieving higher quality particle separation compared with traditional approaches.

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