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(G) Novel Conditional Generative Approach and Applications in Nuclear and Particle Physics

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A novel Machine Learning architecture has been recently developed combining cutting-edge conditional generative models with clustering algorithms. This model relies on information from one reference class and can be deployed for different applications in nuclear and particle physics, e.g., one-class classification, data quality control, and anomaly detection.

The flexibility of the architecture allows also an extension to multiple categories. We explore its utilization for neutron identification in the Barrel Calorimeter at GlueX, along with an anomaly detection method for Beyond Standard Model physics at the Large Hadron Collider.

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