Contribution ID: **41** Type: **Short talk**

Ephemeral Learning - Augmenting Triggers with Online-Trained Normalizing Flows

Thursday, 12 May 2022 16:05 (15 minutes)

The large data rates at the LHC make it impossible to store every single observed interaction. Therefore we require an online trigger system to select relevant collisions. We propose an additional approach, where rather than compressing individual events, we compress the entire data set at once. We use a normalizing flow as a deep generative model to learn the probability density of the data online. The events are then represented by the generative neural network and can be inspected offline for anomalies or used for other analysis purposes. We demonstrate our new approach for a toy model and a correlation-enhanced bump hunt.

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Session Classification: Workshop