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## Autonomous selection of physics events: A RHIC demonstrator for EIC physics

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With ever-increasing collision rates producing larger data volumes and the search for rarer physics processes, it is becoming apparent that autonomic decision making can play a key role in tagging physics events of interest to specific groups or filtering data streams to manageable levels. A demonstrator for separating events with a heavy flavor decay from background events in proton-proton collisions at the Relativistic Heavy Ion Collider (RHIC) with the sPHENIX detector is presented. Due to data volume limitations, sPHENIX is capable of recording 10% of the minimum-bias collisions at RHIC using streaming readout in addition to its 15 kHz hardware trigger of rare events. This demonstrator will use machine-learning algorithms on FPGAs to sample the remaining 90% of the collisions, determine the event topology and send a decision to the data acquisition system to record events of interest. The design of the demonstrator and its use at sPHENIX will be refined for deployment at the EIC for the tagging of heavy flavor decays and DIS-electrons.

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**Session Classification:** Calibration, Monitoring, and Experimental Control in Streaming Environments