



Contribution ID: 497

Type: **Poster**

# sPHENIX DAQ and Trigger

*Tuesday 5 September 2023 17:30 (2h 10m)*

The new sPHENIX detector at RHIC will begin commissioning with Au+Au collisions at 200 GeV in Spring 2023. The sPHENIX trigger system is paramount to the success of the sPHENIX physics program. A system of custom digital Local Level-1 electronics (LL1) will enable trigger primitive generation related to interaction selection, jets, photons, hadrons, and Upsilon to pass to the Global Trigger (GL1). A single LL1 board compresses primitives from up to 1536 detector readout channels and produces a digest of event classifications that will be passed to the GL1. The Minimum Bias Detector (MBD) trigger will provide the primary selection criterion of vertex determination, triggering on hits in the high-rapidity region covered by the MBD. This will be pivotal in synchronizing the data-acquisition of separate detectors to collisions at RHIC. Next, the jet, photon, and hadron trigger will search for windows of high energy deposition in the electromagnetic (EMCAL) and the hadronic calorimeter (HCAL), seeking out collisions with jet production. For this trigger an additional set of LL1 electronics are used to collect information from the entire calorimeter system. Finally the electron pair trigger is designed to capture decayed Upsilon and will invoke a peak-finding algorithm to find pair electrons deposited into the EMCAL. This poster overviews the design and strategy of the LL1 trigger and will discuss the performance of the trigger and data acquisition systems and the status of trigger efficiency studies based on year-1 data, compared to emulated data from sPHENIX simulations.

## Category

Experiment

## Collaboration (if applicable)

**Primary author:** LIS, Daniel

**Presenter:** LIS, Daniel

**Session Classification:** Poster Session

**Track Classification:** Future facilities/detectors