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Data Driven Triggers for the NOvA Experiment

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The NOvA experiment has an 810 km long baseline and uses the upgraded NuMI neutrino beam from Fermi National Accelerator Laboratory to study neutrino oscillation parameters. The two fully active, functionally identical detectors are placed 14 milliradians off axis to access a narrow neutrino energy spectrum, due to the pion decay kinematics. The 300 ton near detector, located at Fermilab, is dwarfed by the 14 kton far detector at Ash River, MN and will be the largest free standing plastic structure in the world.

A data driven trigger framework has been developed to aid in achieving the physics goals of NOvA. It has been implemented as an alternative trigger path to the timing trigger of beam spills, as well as the gateway to explore physics unrelated to beam neutrinos. The data acquisition of the detector has a continuous readout enabling this trigger framework to record zero biased data. It has many commonalities to our analysis framework, handling the data stream in pseudo-real time, to ease the development by our collaborators. The status of several triggers as well as other proposed applications will be presented.

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