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Online Supernova pointing with Trigger Primitives in DUNE

Among the different parts of its vast physics programme, DUNE will aim at observing neutrinos from a Core-Collapse SuperNova Burst (CCSNB). The experiment will then contribute to SNEWS, to provide both a trigger signal and a reconstructed direction for the explosion. Online pointing, achieved in a timescale of a few minutes, will allow to move telescopes in the correct direction to observe early photons, arriving shortly after neutrinos. The DUNE data size makes it challenging to do it quickly; therefore, we propose an approach that makes use of Trigger Primitives, a DAQ data format that is easily accessible during readout and more compact than the raw data, by over two orders of magnitude. This novel standalone pipeline makes use of a combination of classical and Machine Learning algorithms to perform the data selection and analysis up to the computation of a direction and a resolution for the CCSNB. In this poster, we present the sequence of the different steps up until the actual pointing, with the first results.

Collaboration(s)

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