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Pointing to a supernova with the DUNE experiment

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The detection of a supernova burst is a unique opportunity to derive insights on astro and particle physics especially neutrinos. Neutrinos are the first hint of a supernova occuring to arrive on Earth due to their very low interaction cross section. They can provide extremely valuable information on the direction of burst enabling to point optical detection systems there in a multi messenger approach.

The Deep Underground Neutrino Experiment (DUNE) aims at detecting these neutrinos with time projection chambers (TPCs) containing up to 40 ktons of liquid argon, located under an overburden of about 1500 m. This technology has an excellent 3D imaging capability.

On my poster, I will show the pointing resolution achievable with the current framework. Ultimately, an online pointing analysis is required for the multi messenger approach. I will present an outline on the conversion of the existing code to a fast online version highlighting where machine learning can improve the speed and precision of the result.

Author: HAKENMÜLLER, Janina (Duke University)

Presenter: HAKENMÜLLER, Janina (Duke University)

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