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An absolute neutrino mass measurement with the DUNE experiment

Supernova (SN) explosions are the most powerful cosmic factories of all-flavors, MeV-scale, neutrinos. The presence of a sharp time structure during a first emission phase, the so-called neutronization burst in the electron neutrino flavor time distribution, makes this channel a very powerful one. Large liquid argon underground detectors, like the future Deep Underground Neutrino Experiment (DUNE), will provide precision measurements of the time dependence of the electron neutrino flux.
In this contribution, I derive a new neutrino mass sensitivity attainable at the future DUNE far detector, obtained by measuring the time-of-flight delay in the SN neutrino signal from a future SN collapse in our galactic neighborhood. Comparison of sensitivities achieved from the two neutrino mass orderings is discussed, as well as the effects due to Earth matter.

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