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nuSTORM to long baselines: a hybrid neutrino factory

The neutrinos from stored muons (nuSTORM) facility aims to use a muon storage ring fed by the Fermilab main injector and a new target station to yield a neutrino beam from muon decay. This flavor-pure beam with a flux certainty of less than 1% / 50MeV provides unprecedented precision for neutrino interaction physics and sterile neutrino searches.

In addition, the neutrino beam produced from the initial pion decay has significant advantages over traditional neutrino beams due to charge and momentum selection after the target-capture equipment. This provides a muon neutrino beam with comparable flux at the first oscillation maximum at ~1000km baselines, whilst eliminating wrong-sign and high-energy backgrounds entirely.

The simulation of the nuSTORM pion-decay beam will be presented along with the resulting flux at currently proposed baselines.

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