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nuPIL: Neutrinos from a Pion Beam Line

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The Deep Underground Neutrino Experiment (DUNE) was proposed to determine the neutrino mass hierarchy and demonstrate leptonic CP violation. The current design of the facility that produces the neutrino beam (LBNF) uses magnetic horns and a decay pipe to collect pions and then to allow them to decay. At neutrinos from a pion beam line (nuPIL), we present the design of a possible substitution for the conventional neutrino beam in LBNF, a FODO magnet beamline for the pions. The neutrinos from nuPIL are flavor-pure and can be well understood by implementing standard beam measurement instrumentation. The neutrino flux and the resulting δ_{CP} sensitivity from the FODO nuPIL are also presented in the paper.

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