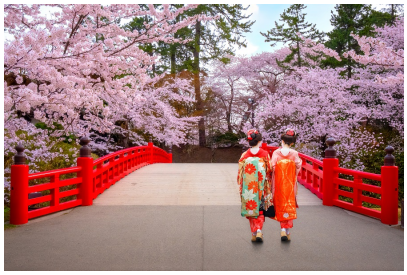

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Improvement in PID methods for selecting electron neutrino events in the upgraded near detector of T2K

The T2K experiment aims to verify leptonic CP violation by precisely measuring the neutrino oscillation probability. From the previous data analysis, leptonic CP violation is confirmed at 95% C.L. To further improve the experiment sensitivity up to the 3σ C.L. a major accelerator upgrade has been done with the goal of increasing the neutrino beam intensity beyond 1 MW. Moreover, also the reduction of the neutrino cross section systematic uncertainty becomes crucial. Hence, the measurement of the electron neutrino cross section with a high precision is necessary. Since electron neutrino contribute to only about 1% of the neutrino beam, to achieve the goals, electron neutrino interaction events have to be selected with both high purity and efficiency.
A new detector, called SuperFGD, is currently being assembled and will start collecting neutrino data in 2023. It is composed of about 2 million scintillator cubes and is able to reconstruct tracks of charged particles and, at the same time, perform particle identification (PID). As a result, it is possible to reconstruct electromagnetic showers caused by electron neutrino interactions in detail. In this poster presentation, the current status of the PID method of electron neutrino selection in SuperFGD will be discussed.

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