

A novel Scintillator Tracker for the HK ND280++ Upgrade

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Hyper-Kamiokande (HK) will start collecting accelerator neutrino data in 2028 to search for leptonic CP violation. Compared to current long-baseline neutrino oscillation (LBNO) experiments, HK's sensitivity will not be limited by statistics but by systematic uncertainties. To reduce the latter, LBNO experiments rely on a set of detectors: the far detector measures the oscillated neutrino spectrum, while the so-called near detectors characterise the neutrino beam before oscillation and provide neutrino cross-sections. One of the near detectors of HK is ND280, the near detector for the current-generation LBNO experiment, T2K. ND280 recently underwent an upgrade during which some of the original subdetectors were replaced with a set of novel detector systems. While this will already significantly reduce the systematic uncertainties, an additional upgrade, ND280++, in the HK era is under consideration to fully exploit the physics potential of HK. After a short introduction of the upgraded ND280, the talk will cover the possible ND280++ upgrade with the focus on a feasibility study about using a multi-tonne opaque liquid scintillator tracker as a subdetector for this upgrade.

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