



## Poster session 3 – Wednesday 6 July

### P3.026 **fiTQun: water Cherenkov event reconstruction for current and future experiments**

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fiTQun is an event reconstruction package originally developed for the Super-Kamiokande detector, based on an algorithm used in the MiniBooNE experiment. In fiTQun, events are described by a collection of particle tracks, for which a prediction of the hit time and collected charge is made at each photosensor. These predictions are compared to the observed quantities via probability density functions to build likelihood functions that are maximised to yield best-fitting event hypotheses. fiTQun has been deployed for  $\pi^0$  rejection in T2K electron-neutrino appearance measurements, and studies are being concluded for entirely fiTQun-based event selections for both T2K long-baseline and Super-Kamiokande atmospheric neutrino analyses. In addition, fiTQun has been adapted to run on events generated with the Geant4-based WCSim simulation package, having been selected as the default reconstruction method for both the Hyper-Kamiokande and NuPRISM future experiments. This poster describes fiTQun's physics impact, as well as its latest developments and future plans.