



ID de Contribution: 67

Type: Non spécifié

Betting to reconstruct Cherenkov rings in large neutrino detectors

mercredi 29 mars 2023 08:30 (15 minutes)

Within the context of the ongoing Super-Kamiokande experiment, and in preparation for the Hyper-Kamiokande experiment, I will present a new paradigm to reconstruct Cherenkov rings events inside water detectors viewed by photo-sensors. Using concepts from information theory, an environment for reinforcement learning can be set to classify the recorded hits of an event, similarly to ranking and betting on these hits with respect to the arrival time of Cherenkov photons.

This project is part of ongoing work for treating systematic uncertainties in a computationally efficient and comprehensive manner, by speeding up the simulations and event reconstruction to vary detector parameters for large water-Cherenkov detectors. Consistent propagation of systematic error uncertainties, based on many nuisance parameters, is a persistent difficulty in particle physics and astrophysics experiments. Where low-level effects are not amenable to simple parameterization or re-weighting, analyses often rely on discrete simulation sets to quantify the effects of nuisance parameters on key analysis observables. Such methods may become computationally untenable for analyses requiring high statistics Monte Carlo with many parameters, especially in cases where these parameters are described with a continuous distribution.

Auteur principal: ZSOLDOS, Stephane (King's College London)

Orateur: ZSOLDOS, Stephane (King's College London)

Classification de Session: Neutrinos

Classification de thématique: Neutrinos