Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **3161** Type: **Oral (Non-Student) / Orale (non-étudiant(e))**

Machine learning techniques to enhance event reconstruction in water Cherenkov detectors

Wednesday 8 June 2022 13:15 (30 minutes)

Hyper-Kamiokande is the next generation water-Cherenkov neutrino experiment, building on the success of its predecessor Super-Kamiokande. To match the increased precision and reduced statistical errors of the new detectors, improvements to event reconstruction and event selection are required to suppress backgrounds and reduce systematic errors. Machine learning has the potential to provide these enhancements to enable the precision measurements that Hyper-Kamiokande is aiming to perform. This talk provides an overview of the areas where machine learning is being explored for water Cherenkov detectors. Results using various network architectures are presented, along with comparisons to traditional methods and discussion of the challenges and future plans for applying machine learning techniques.

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Session Classification: W2-1 Machine Learning in HEP and Novel Reconstruction Tools (PPD) | Apprentissage automatique en PHE et nouveaux outils de reconstruction (PPD)

Track Classification: Technical Sessions / Sessions techniques: Particle Physics / Physique des particules (PPD)