



Contribution ID: 39

Type: Individual talk

## Inverse Beta Decay Reconstruction in Super-Kamiokande with CNNs

*Friday, July 24, 2020 10:40 AM (25 minutes)*

Inverse beta decay is the primary interaction mode for low energy electron anti-neutrinos, producing two signals in a water Cherenkov detector like Super-Kamiokande: a low energy positron and,  $\sim 200 \mu\text{s}$  later, a neutron capture on hydrogen producing a 2.2 MeV photon. These result in only  $\sim 10$  of SK's 11,000+ photomultiplier tubes being hit by light, making them difficult to differentiate from radioactive background. If the two hit patterns are overlaid, however, the combined information could serve as input for a convolutional neural network. The initial investigations into a CNN IBD reconstruction tool for SK will be presented.

**Author:** GOLDSACK, Alexander (University of Oxford/Kavli IPMU)

**Presenter:** GOLDSACK, Alexander (University of Oxford/Kavli IPMU)

**Session Classification:** Day 5 Morning