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Machine Learning approach to neutrino experiment track reconstruction : DUNE/ uBooNE/ NOvA

Thursday 9 March 2017 15:00 (45 minutes)

Neutrino experiments discussed in this talk represent a category of event reconstruction problems very distinct from the collider experiments. The two main differences are: i) the representation of data, in form of 2D, high resolution, image-like projections, and ii) the nature of neutrino interactions observed in the detectors, with their high diversity of topologies and undefined location of the interaction point. In such conditions, two basic features of events have to be reconstructed: flavor and energy of incident neutrino.

DUNE and MicroBooNE are Liquid Argon Time Projection Chamber (LArTPC) based experiments, while NOvA's detector is made of liquid scintillator filled cells. The technology choice in these experiments results in the different resolution of recorded "images", however the basic concepts in the reconstruction and application of the machine learning techniques, are similar. I will discuss those, focusing on the expected DUNE detector conditions and reconstruction approaches currently being developed.

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Track Classification: 0 : Algorithms and theoretical analysis