Contribution ID: **68**　　　　　　　　　　　　Type: **On-site planned, but remote also possible**

Tau lepton kinematics reconstruction using Deep Learning.

Searches for the new phenomena that consider signature with τ leptons is of big interest at the CERN LHC. The reconstruction of tau decaying to hadrons (τ_h) is based on the hadron-plus-strip (HPS) algorithm, which combines the charged hadrons and π^0 candidates, obtained by clustering photon and electron candidates. However, in contrast to this combinatorial approach this problem can be solved with using constituent particles (electrons, photons, charge hadrons) and its properties as an input to the neural network to regress the visible component of τ_h momentum. This project is aimed at studying of applicability of different neural network architectures and input representations for the tau lepton reconstruction. Such flexible algorithm would give an opportunity to optimize tau reconstruction in the regions where current HPS algorithm has poor performance, for instance significantly displaced taus.

Field

B1: Particle physics analysis (software-oriented)

DESY Place

Hamburg

DESY Division

FH

DESY Group

CMS

Special Qualifications:

Basic knowledge of Particle Physics, good knowledge of python, experience with neural networks and Linux system.

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