Contribution ID: **68**   Type: **Poster**

Optimisation of Electron DNN ID Working Points and charge misidentification selection in Four-Top-Quark Multilepton Analyses using Run 3 data

We present a study of electron identification (ID) working points developed by the ATLAS e-gamma group for Run 3, aiming to optimize selection strategies in multilepton final states targeting four-top-quark production. We compare the performance of the Run 2–recommended Deep Neural Network–based (DNN) ID and Charge-flip evaluated at Loose, Medium, and Tight working points. The DNN was trained on Run 2 data, though it is intended for use in Run 3 analyses. This study focuses on two key processes: the observation of Standard Model four-top-quark production using the full Run 3 dataset, and the search for
, which combines full Run 2 and partial Run 3 data. A central objective is to assess whether using looser DNN working points can improve signal statistics without significantly increasing background contamination, especially from electron charge misidentification (qmisID), which is a dominant source in same-sign dilepton and trilepton channels. The results aim to guide the optimal choice of electron ID strategy for Run 3 multilepton analyses.

Author: MOYANO GÓMEZ, Helena (IFAE)

Co-authors: Dr JUSTE, Aurelio (CERN, IFAE);   Dr RIU, Imma (IFAE, CERN);   Dr QIN, Quake (IFAE, CERN)

Presenter: MOYANO GÓMEZ, Helena (IFAE)