



Contribution ID: 358

Type: **Poster Presentation**

## Deep Learning in Flavour Tagging at the ATLAS experiment

A novel higher-level flavour tagging algorithm called DL1 has been developed using a neural network at the ATLAS experiment at the CERN Large Hadron Collider. We have investigated the potential of Deep Learning in flavour tagging using higher-level inputs from lower-level physics-motivated taggers. A systematic grid search over architectures and the training hyperparameter space is presented. In this novel neural network approach, the jet flavours are treated on an equal footing while training with multiple output nodes, which provides a highly flexible tagger. The DL1 studies presented show that the obtained neural network improves discrimination against both light-jets and c-jets, and also provides a novel c-tagging possibility. The performance for arbitrary background mixtures can be fine-tuned after the training by using iso-efficiency lines of constant signal efficiency, according to the needs of the physics analysis. The resulting DL1 tagger is described and a detailed set of performance plots presented, obtained from simulated  $t\bar{t}$  events at  $\sqrt{s}=13$  TeV and the Run-2 data taking conditions where this tagger will be applied.

### Experimental Collaboration

ATLAS Collaboration

**Presenter:** LANFERMANN, Marie (Universite de Geneve (CH))**Session Classification:** Poster session**Track Classification:** Top and Electroweak Physics