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Using Graph Neural Networks for Flavour Tagging in Heavy Ion Collisions

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Heavy ion collisions create a region of extreme energy density near the collision point where quarks and gluons behave as nearly free particles. This state of matter is called quark-gluon plasma (QGP). The QGP is very challenging to study since it is extremely short lived and never reaches the detector. However, by analysing jets created at the same time as the QGP, that do reach the detector and comparing them to jets from proton-proton collisions, it is possible to see how the jets produced in the heavy ion collisions were affected by the QGP. Now the issue becomes identifying which particles gave origin to the jets, a task known as jet flavour tagging.

This project aims to study how one of the ATLAS Collaboration's flavour tagging algorithms, called GN2, behaves when trying to identify jets from heavyion collisions, motivated by the prospect of one day discovering more about the QGP.

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