

## Quarks vs. Gluons for Higgs->invisible searches (20'+5')

*Thursday, 15 November 2018 13:00 (25 minutes)*

Quark-gluon discrimination could greatly improve the sensitivity of a number of analyses at the LHC, and as such has received a significant amount of investigation. Because the differences between quark and gluon jets are largely contained in the jet substructure and are often very subtle, this problem lends itself to machine learning techniques. We explore this question in the LoLa framework, and demonstrate that we see good discrimination for pure quark and gluon jets, both at particle level and after including a fast detector simulation. Next, we apply our network to a physics problem, a monojet Higgs -> invisible signal (gluon dominated) with a Z+monojet background (quark dominated). We investigate how this differs from the pure quark-gluon case and how the jet transverse momentum affects the network performance.

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