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Flavour-tagging at FCC

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Jet flavour identification plays a central role in unlocking the full physics potential of the Future Circular Collider (FCC). In particular, flavour tagging is essential for the FCC-ee Higgs programme, where hadronic decays dominate. The ability to efficiently distinguish between b-, c-, s-, and gluon jets enables the study of rare Higgs decay modes that remain inaccessible at the LHC, thereby opening up new avenues in Higgs boson research.

This contribution introduces transformer-based jet flavour tagging algorithms that leverage detailed particle-level information. These algorithms achieve excellent performance in identifying b- and c-jets, and, crucially, also show sensitivity to jets originating from strange quarks. This capability enhances the prospects for probing the Higgs coupling to strange quarks. Presented studies explore how different detector design choices affect tagging performance and, thus, our prospects to determining Higgs' couplings with unprecedented accuracy.

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