Laboratório de Instrumentação e Física Experimental de Partículas

LIP Seminar

Thursday, 30 July, 11h30

Unravelling the inner structure of jets with dynamical grooming

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The analysis of jet observables is crucial to study the theory of strong interactions, QCD, in the perturbative regime. These phenomena also play an important role in constraining the background in searches for heavy particles beyond the Standard Model, a cornerstone in the physics program of the LHC. In the context of heavy-ion collisions, jet physics is immersed into the precision era to quantify the effect of the Quark Gluon Plasma on QCD dynamics. However, jet observables, both in p+p and A+A collision, are strongly affected by a wide range of processes, such as hadronization, underlying event or pileup, that are hard to account for in perturbation theory and conventional resummation techniques. Aiming at reducing the jet's sensitivity to non-local and non-perturbative physics, several jet grooming techniques have been developed. In this talk, I will introduce a new set of jet substructure observables and an associated grooming technique, called dynamical grooming. It is rooted on identifying the hardest splitting in an angular ordered shower and discarding all splittings at larger angles. I will benchmark the method in QCD jets with pQCD calculations of dynamically groomed observables at modified leading-log accuracy that qualitatively agree with preliminary ALICE measurements. Next, the resilience to non-perturbative effects together with its performance on boosted W/top tagging will be assessed. Finally, a Monte-Carlo study for dynamically groomed observables in heavy-ion collisions will be presented.

Location: Videoconference - Zoom
https://indico.lip.pt/event/743/
Connection details
URL: https://videoconf-colibri.zoom.us/j/99842372416
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