Contribution ID: **23**   Type: **not specified**

The Lund Jet Plane

Wednesday 17 October 2018 11:10 (20 minutes)

Lund diagrams, a representation of the phase space within jets, have long been used in discussing parton showers and resummations. We point out here that they can also serve as a powerful tool for experimentally characterising the radiation pattern within jets. We briefly comment on some of their analytical properties and highlight their scope for constraining Monte Carlo simulations. We then examine the use of the Lund plane for boosted electroweak boson tagging. When used as an input to deep-learning methods it yields high performance. Furthermore, much of that performance can be reproduced by using the Lund plane as an input to simpler log-likelihood type discriminators. This suggests a potential for unique insight and experimental validation of the features being used by machine-learning approaches. In the context of our discussion, we also highlight the importance of accounting for detector effects when considering the performance of machine-learning approaches.

Application

Object ID

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Session Classification: External To Atlas

Track Classification: External