

The Lund Jet Plane

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Lund diagrams, a representation of the phase space within jets, have long been used in discussing parton showers and resummations. I will point out that they can also serve as a powerful tool for experimentally characterising the radiation pattern within jets. I will briefly comment on some of their analytical properties and highlight their scope for constraining Monte Carlo simulations. I will examine the use of the Lund plane for boosted electroweak boson tagging, which when used as an input to deep-learning methods 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 this discussion, I will also highlight the importance of accounting for detector effects when considering the performance of machine-learning approaches.

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