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## Intrinsic- $k_T$ and soft-gluons in Monte Carlo generators

*Tuesday 8 July 2025 10:10 (20 minutes)*

The talk addresses the interplay of perturbative and non-perturbative physics in Monte Carlo (MC) generators.

We summarize the studies carried out so far within the TMD parton branching (PB) approach on the extraction of intrinsic transverse momentum (intrinsic- $k_T$ ) from Drell-Yan (DY) predictions at different center-of-mass energies and in different ranges of invariant mass of the lepton pair. The recent PB study shows a striking difference in the center-of-mass energy dependence of intrinsic- $k_T$  compared to standard Monte Carlo (MC) generators: whereas the PB approach finds basically no energy dependence, the standard MCs show a strong dependence. This difference can be associated with the radiation modelling and with the interplay of the effects related to soft-gluon emission and intrinsic- $k_T$  distribution. We comment on the possibility of the flavor dependence of the intrinsic- $k_T$  distribution.

### Secondary track

**Authors:** LELEK, Aleksandra; HAUTMANN, Francesco; FAVART, Laurent; MOUREAUX, Louis

**Presenter:** MOUREAUX, Louis

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