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# Improved transverse momentum dependent factorization with KaTie

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KaTie is a parton level event generator that can deal with space-like initial-state partons, which occur in factorization prescriptions for hadron scattering that involve non-vanishing momentum components transverse to scattering hadrons. Improved transverse momentum dependent factorization (ITMD) is such a prescription. It allows to include saturation effects into hadron collisions in a consistent and gauge invariant manner, and for a large range of values for the transverse momentum. It requires a non-trivial treatment of the color structure of hard matrix elements, the implementation of which into KaTie is presented.

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