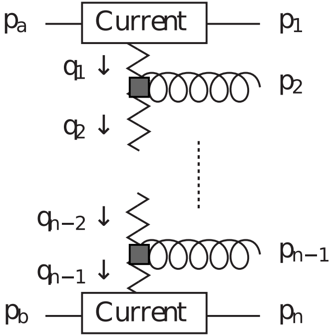
Adding Subleading Processes to HEJ

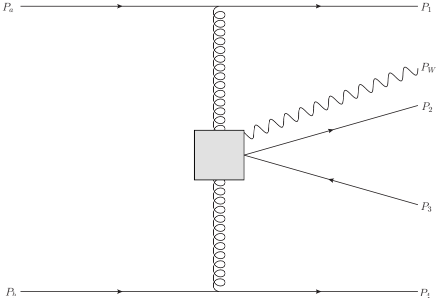
The MRK Limit:

large $\hat{s}$; small P_T ; **strongly ordered jet rapidities ($\mathbf{y_j}$):**

$$y_1 \ll y_2 \ll \ldots \ll y_i \ll .. \ll y_{n-1} \ll y_n$$



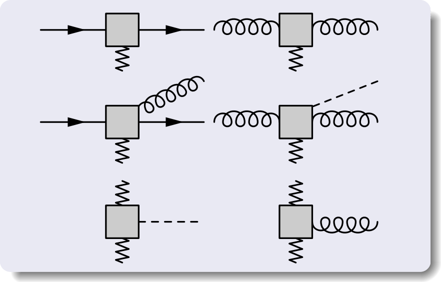
$$|\mathcal{M}|^2 \sim j^\mu j_\mu$$

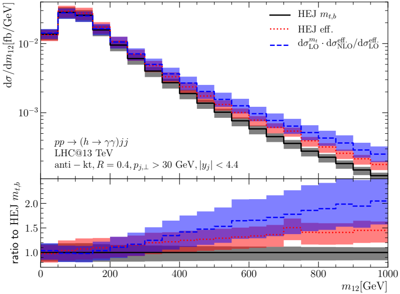


$$|\mathcal{M}|^2 \sim j^\mu X_{\mu\nu} j^\nu$$

Higgs plus Dijet in *High Energy Jets*

High Energy Limit:	Large $\Delta y_{ij}, p_{i\perp} \sim p_{j\perp} \Leftrightarrow$ Large s_{ij}, $t_{ij} = \text{const.}\ \forall i, j$
$\Rightarrow$	$\mathcal{M}$ becomes independent of $y \Rightarrow \sigma \propto \Delta y$
High Energy Jets:	Resumming large $\log s/t \sim \Delta y$
$\Rightarrow$	Approximation on amplitude level
$\Rightarrow$	Build up Matrix Element sequentially





Multiplet bases wish list

We tell you about existing resources for multiplet bases:

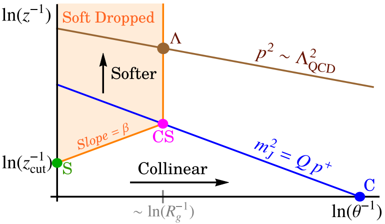
- construction recipes,
- readily constructed bases,
- 3j and 6j symbols,
- expansion algorithms,
- recursion relations,
- software.

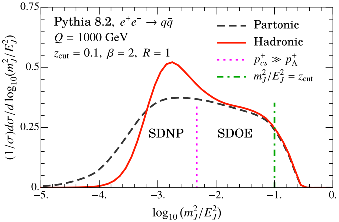
You tell us what you would need in order to be able to use multiplet bases in your own work.

Nonperturbative Corrections to Soft Drop Jet Mass

Hoang, Mantry, Pathak, Stewart 1906.xxxxx

Focus on the region where the soft drop stopping subjet is perturbative:
Soft drop operator expansion region.





Consider the perturbative modes in the EFT and determine the leading nonperturbative mode in the SDOE region: $\frac{Q\Lambda_{\rm QCD}}{2m_J^2}\left(\frac{4m_J^2}{Q^2 z_{\rm cut}}\right)^{\frac{1}{2+\beta}} \ll 1$

Derive the leading power corrections to the partonic cross section:

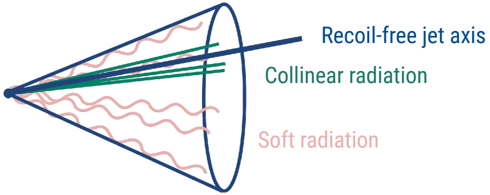
- 3 universal hadronic parameters (indep. of zcut, beta, R, Q, and mJ)
- Perturbatively calculable Matching coefficients.
- LL resummation of matching coefficients in the coherent branching formalism

$$\frac{d\sigma_\kappa^{\rm had}}{dm_J^2} = \frac{d\hat{\sigma}_\kappa}{dm_J^2} - Q\,\Omega_{1\kappa}^{\infty}\,\frac{d}{dm_J^2}\left(C_1^\kappa(m_J^2, Q, \tilde{z}_{\rm cut}, \beta, R)\,\frac{d\hat{\sigma}_\kappa}{dm_J^2}\right) + \frac{Q(\Upsilon_{1,0}^\kappa + \beta\Upsilon_{1,1}^\kappa)}{m_J^2}\,C_2^\kappa(m_J^2, Q,\ \tilde{z}_{\rm cut}, \beta, R)\,\frac{d\hat{\sigma}_\kappa}{dm_J^2}$$

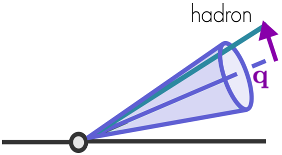
See also a related talk on Friday, 2pm

Lorenzo Zoppi University of Amsterdam
PSR 19 ESI, Wien, 11 June 2019 Blackboard session

Topic: using recoil-free jets to study transverse momentum dependance



Application 1: in-jet fragmentation



Application 2: DIS with jets