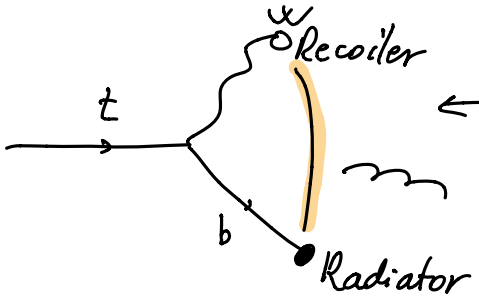
1ST EMISSION (no matter which recoil strategy)

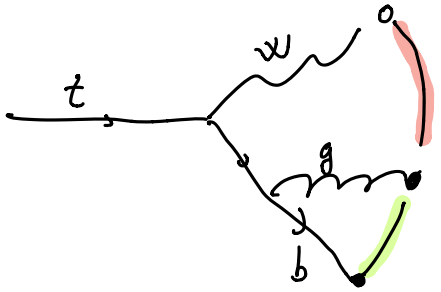


← emissions can access entire phase space

(anyway taken over by POWHEG if doing matching in decays)

After 1ST Emission:

(A) RecoilToColoured = off



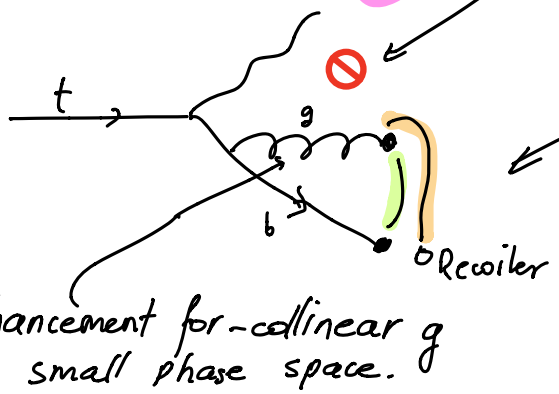
← Gluon "inherits" W as recoiler.

Keeps ~ full phase space.

(But W probably gets more kicks than it deserves.)

(B) RecoilToColoured = on

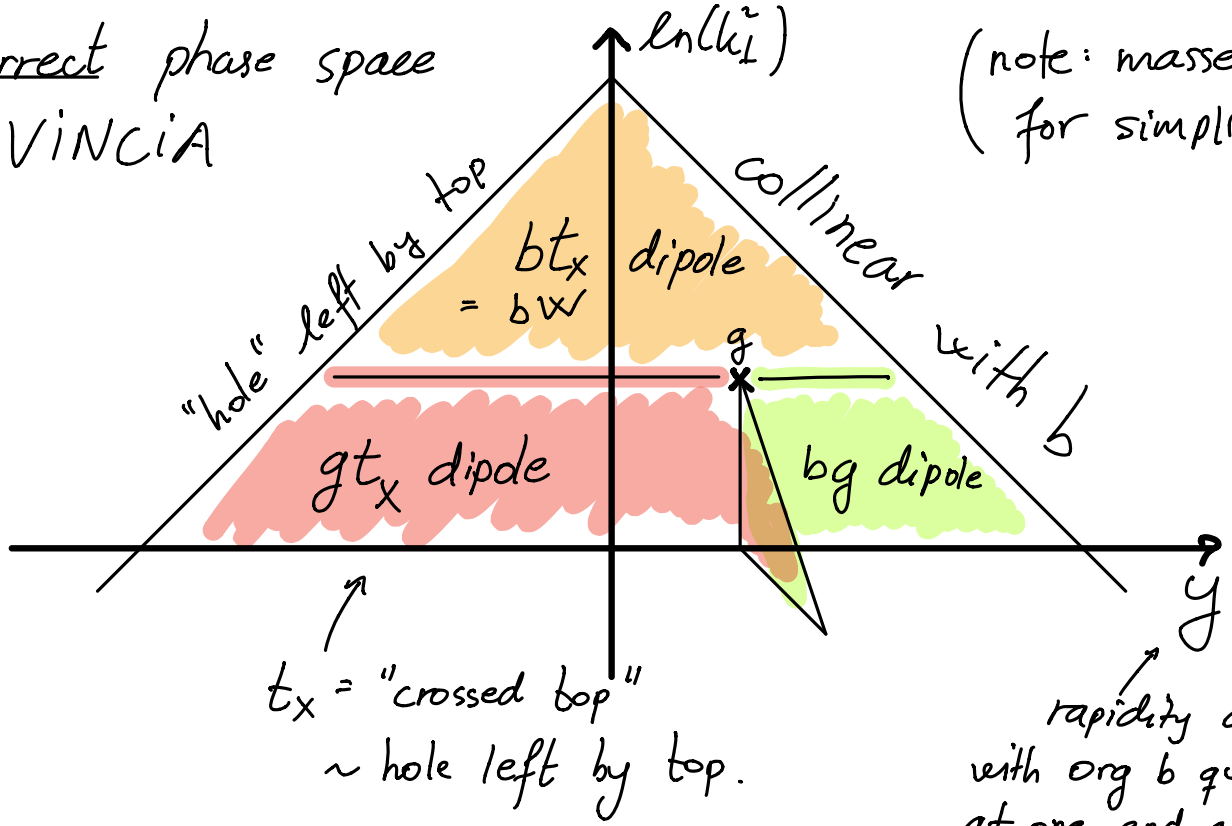
no wide-angle radiation!



enhancement for-collinear g
⇒ small phase space.

Phase space "collapsed" to bg system, (which tends to be pseudo-collinear!)

I think this produces an incorrect resummation of the radiation off the gluon. Using the Lund plane ($\ln k_\perp$ vs rapidity) to illustrate:



(note: masses → 0 for simplicity)