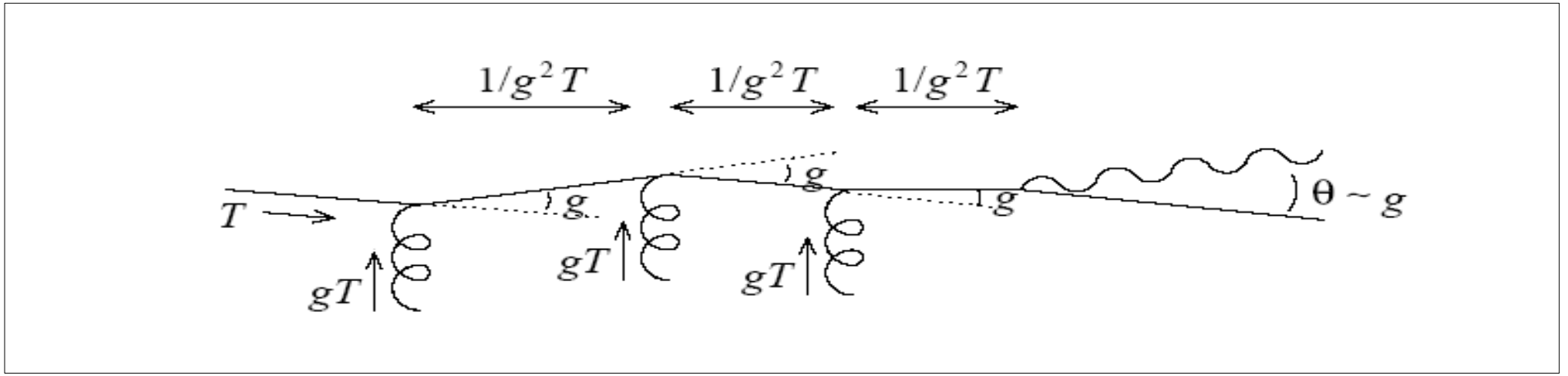
Comparing AMY and HT

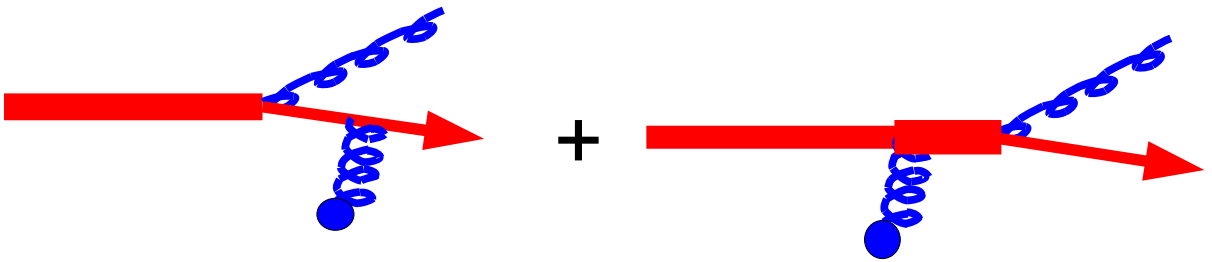
In AMY

- Hot thermal medium of quarks and gluons at T → infinity
- T → infinity implies g → 0, T hard scale, gT is soft yet perturbative scale
- Hard parton with E ~ > T,
- Picks up multiple soft hits, ~ gT from hard particles of ~ T
- The hard lines go off-shell by gT , formation time ~ $(gT)^2/E$
- No interf. with vac. Radiation, consistent for a very long medium
- All interactions at the same scale gT and remain at this scale



In HT

- Medium has short distance color correlation length
- Jet energy E ~ Q hard scale ,
- Jet virtuality λQ softer but still perturbative scale, $\lambda \rightarrow 0$
- $\alpha_s(\lambda Q) \rightarrow 0$ allows weak coupling expansion
- For the jet $p=(p^+, p^-, p_T) = Q(1,\lambda^2,\lambda)$
- Jet scatters off partons from the medium with scale $q = Q(\lambda^2,\lambda^2,\lambda)$
- Scattering makes parton go off-shell with formation time $E/(\lambda Q)^2$
- In each emission, virtuality drops overall, could rise in sub-process and then fall
- Repeating this kernal gives virtuality evolution in matter,



How to compare!

1) Do higher twist with multiple scattering

2) Evaluate the <FF> correlator in HTL perturbation theory

3) Try to take out the vacuum term!

Things that will never be the same!

1) No quark dressing,

2) No concept of virtuality evolution in AMY, difficult to live without it in HT

3) g is not really like λ