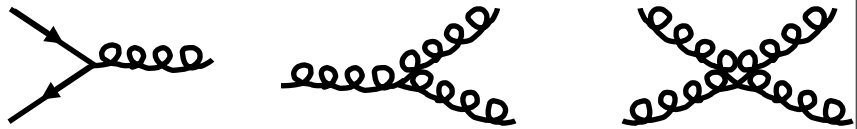
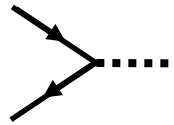
Feynman Rules!

- Draw Feynman diagrams for the processes below using the base interactions shown



  - gg -> tt~



  - gg -> tt~h

  - gg -> tt~bb~

Check at http://madgraph.hep.uiuc.edu/

Sub Process Identification

- Note…. Proton includes up, down, strange and charm quarks, and also gluons

- List processes for signal pp > h > tt~bb~
  - e.g. uu~ > h > tt~ bb~

- List process for background pp > ttbb
  - e.g. uu~ > tt~bb~

- List process for reducible background pp>ttjj
  - e.g. uu~ > tt~gg

Play @ madgraph.hep.uiuc.edu

$$pp \rightarrow \mu^+ \mu^- e^+ e^- /\gamma$$

- Generate SubProcesses + Diagrams
  - Use HEFT for model to get gg>h
- Generate Parton Level Plots
  - Username = Angels
  - Password = D _ _ _ _ _
- Generate Detector Level Plots

Final Project

- Good News….we might have discovered 3 new particles at the LHC (Z', H, W+')!!! Your job is to determine who is who and their mass using the plots provided.

- Go to http://madgraph.hep.uiuc.edu/ choose wiki/docs---Communications---Lectures/Tutorials---2009 CERN Summer School. (or http://cp3wks05.fynu.ucl.ac.be/twiki/bin/view/Physics/CernSummerSchool09)