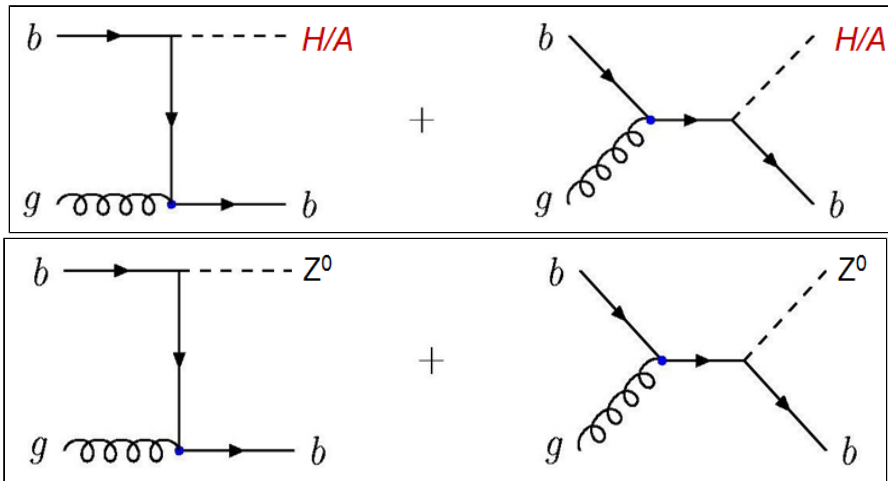


Study of bH and bZ production

As a related study for the searches of [SUSY Higgs H/A production in associate with a b quark](#) and h/H/A decaying to bbbar:



the observation of the analogous Standard Model production of $b+Z(Z\rightarrow b\bar{b})$ can be a very interesting associated analysis to establish the analysis infrastructure and calibrate reconstruction efficiencies and constrain production model uncertainties for the $b+h$ (h is the lightest Higgs with properties close to SM Higgs) analysis. Observing $Z\rightarrow b\bar{b}$ will also be an important milestone of its own right and lending a powerful avenue to calibrating b jet energy. The possible project tasks are expected to be among the following research topics:

1. The suitable analysis strategies at different P_t ranges - how often h/Z to $b\bar{b}$ decays are distinct/merged b/\bar{b} jets ?
2. The recoil b P_t spectrum (also h/Z P_t spectrum) research from various MC generators and MCFM calculations and existing measurements to better understand the workable cross section and its uncertainties for different P_t regimes.
3. bZ production data analysis: background levels and sensitivity for analyses at different P_t regimes.

Literature:

- [b+Z production at 7 TeV \(ATLAS, 36ipb, 2011\)](#)
- [b+Z/gamma production at 7 TeV \(CMS, 2.2ifb, 2012\)](#)
- [Search for \$b' \rightarrow Z + b\$ \(ATLAS, 2ifb, 2012\)](#)

Contact: Su Dong, Emanuel Strauss