H --> ss

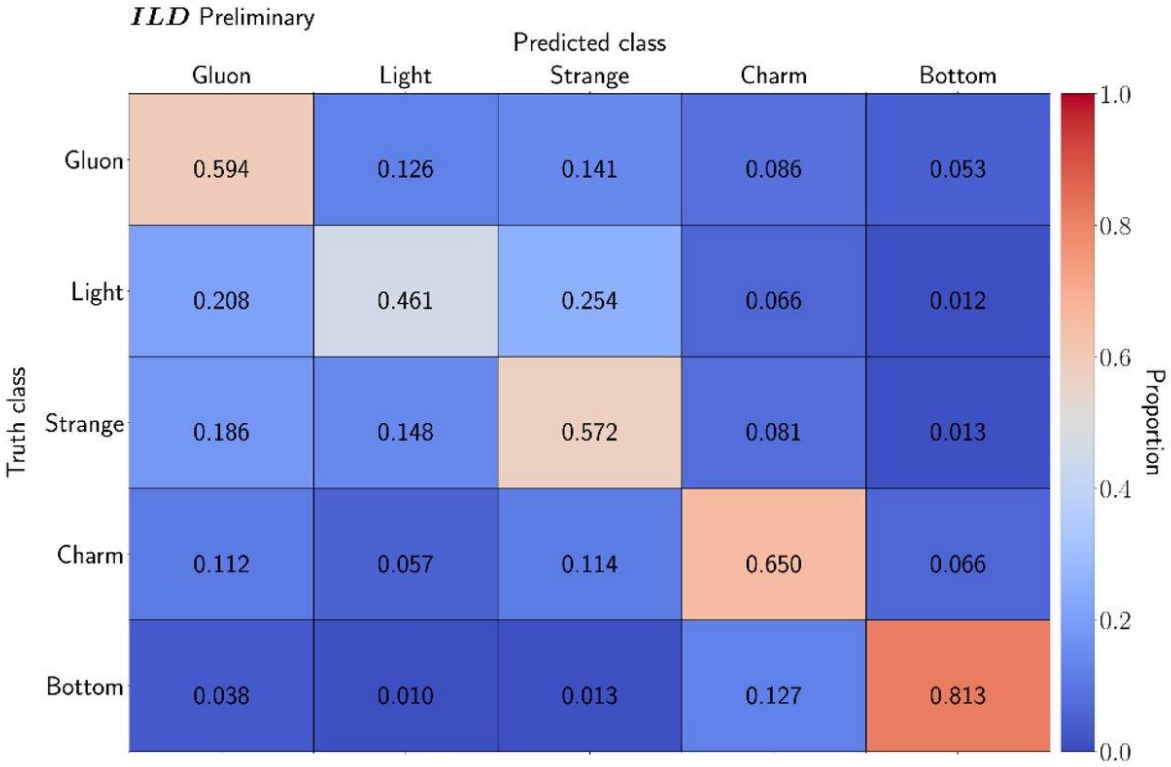
The physics case

- ILC detectors will have excellent vertex resolution
- The precision measurement of Higgs BR is a pillar of the physics program
  - The measurement of the strange Yukawa coupling pushes the envelope
  - We should understand how close we can get to the SM value, what it takes to get there and what prevents us from getting closer
    - This will immediately improve our understanding of the other Higgs BR measurements
    - It will allow us to constrain the BSM parameter space

Samples (Thank you!)

- n23n23H(->ss)
  - Created to have a first look at the channel, first time to look at light quarks
  - Nice clean sample to study signal
  - Not the easiest channel for physics, because of Z -> qq
  - Only one polarization state
- Going to a physics analysis
  - Using ILD_l5_o1_v02/v02-02 as background samples
    - Main background is from Z <--> H confusion and from other H decays
  - New samples needed (already there!)
    - nnHqq -> (all neutrino flavors, q=u,d,s)
    - llHqq (q = u,d,s)
    - q1q1Hq2q2(q1=udscb, q2=u,d,s)

Analysis strategy



- Flavor tagger (already there)
  - Excellent benchmark for taggers
  - First time we look into gluons directly

  ==> See QCD @ ILC talk in physics meeting
- Complete the nnH with the missing samples
- Add llH
- Not sure if we get to qqH before Snowmass
  - Certainly an extremely interesting channel for this analysis
- It may be more fruitful to understand sensitivity to BSM than to explore the SM to the ultimate precision
  - Increased H->ss BF, at what cost? What about other BF? Global H fit?