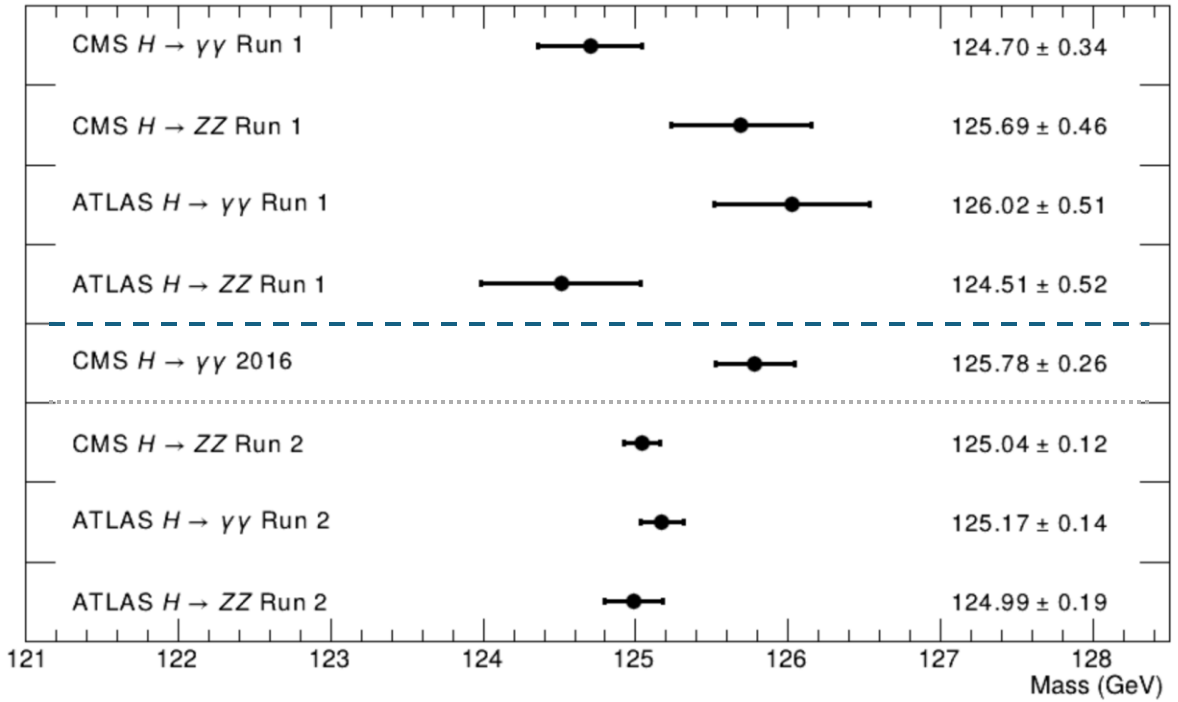
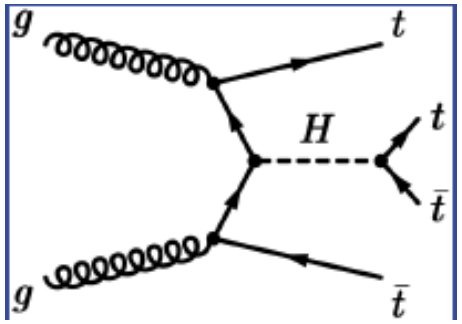
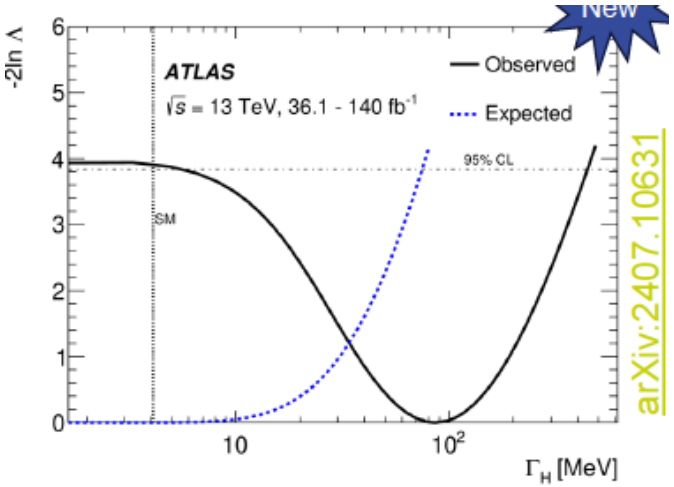
H boson mass and width

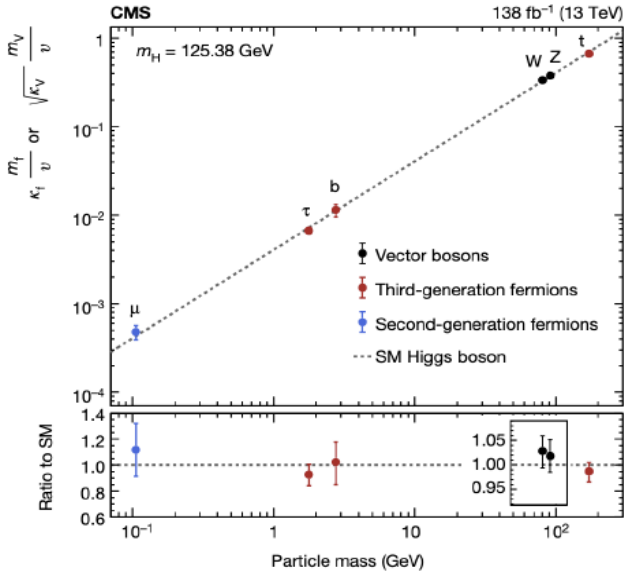
- With Run 2 data, individual analyses below 200 MeV uncertainty
  - Waiting for CMS H → γγ Run 2 with new corrections to reduce systematics…
  - *Will we get to 10 MeV in ~30 years from discovery, or 3 colliders later?*
- Width via off-shell ZZ established, uncertainties below 100%:
  - ATLAS: $4.5\ ^{+3.3}/_{-2.5}$ MeV, CMS: $2.9\ ^{+2.3}/_{-1.7}$ MeV (SM prediction: 4.1 MeV)
  - First attempt also at tree-level by ATLAS using 4-top final state, even if quantitatively not yet competitive ($86^{+110}/_{-49}$ MeV)

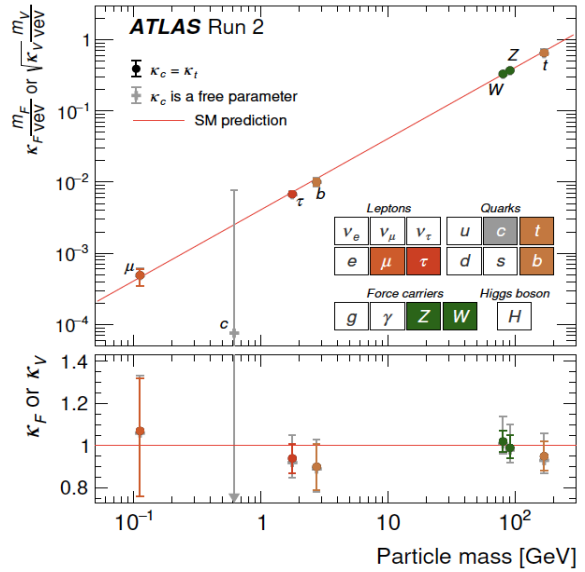




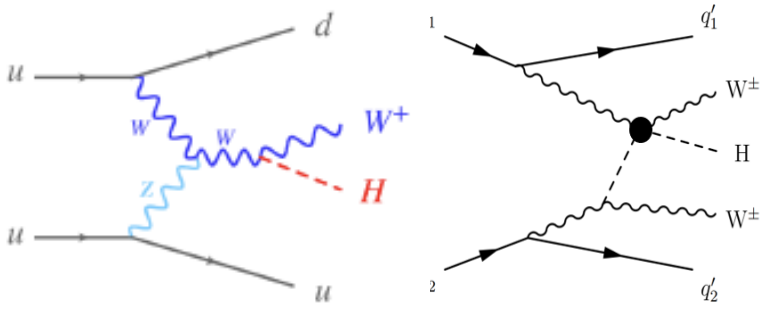


Couplings





- Vector bosons and 3rd gen Yukawa's well known, H → μμ falls nicely on the line
  - It doesn't mean we're done: both collaborations still working hard to release improved results in individual measurements, combinations & interpretations
- Charm is the next frontier, big improvement in VH(cc) with new tools
  - μ < 14 obs (7.6 exp) CMS, μ < 11 obs (10 exp) ATLAS
  - Trying also other approaches, e.g. CMS H + c, but less sensitive (μ < 250)
- Exotic hypotheses also put to the test:
  - $\lambda_{WZ} = \kappa_W/\kappa_Z < 0$ excluded in VBF WH (ATLAS & CMS)
  - κ_{VV} searched for by CMS in VBF WWH

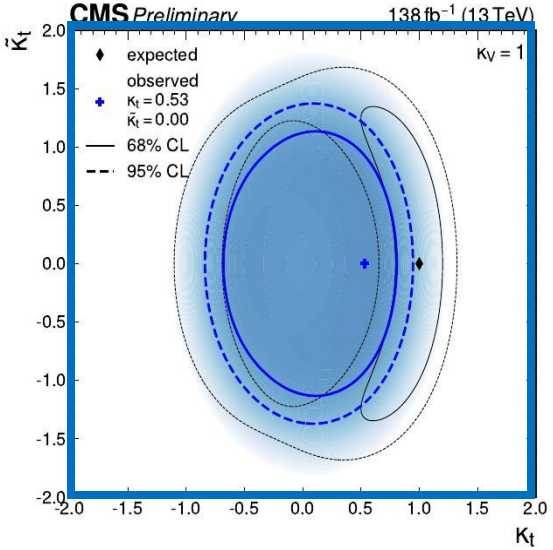


Several tests of CP structure made

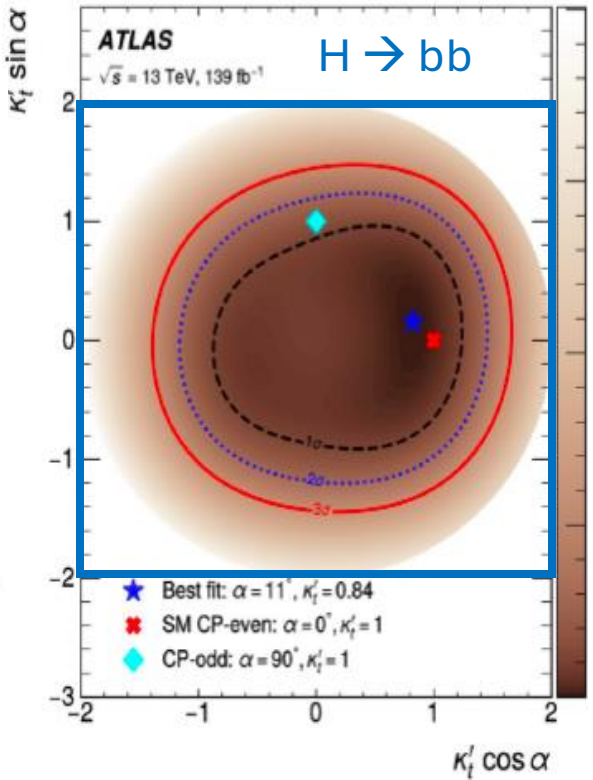
often hard to compare apples to apples

Fermion CPV couplings in ttH

H → bb

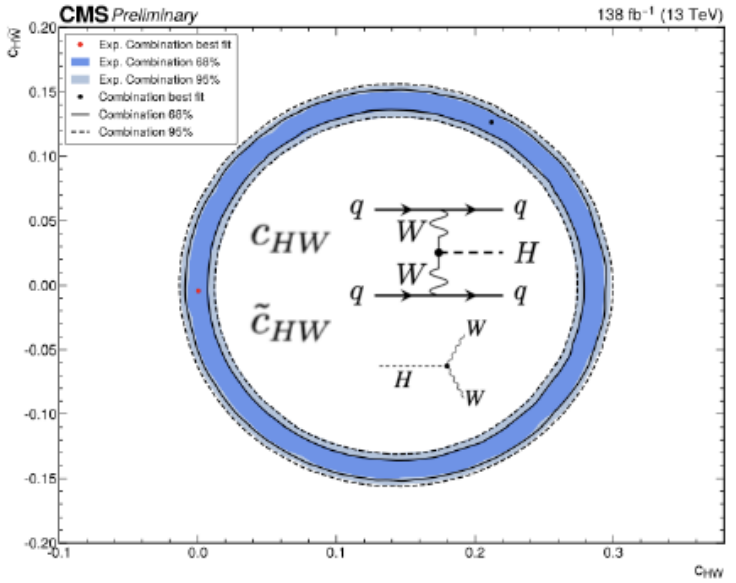


H → bb

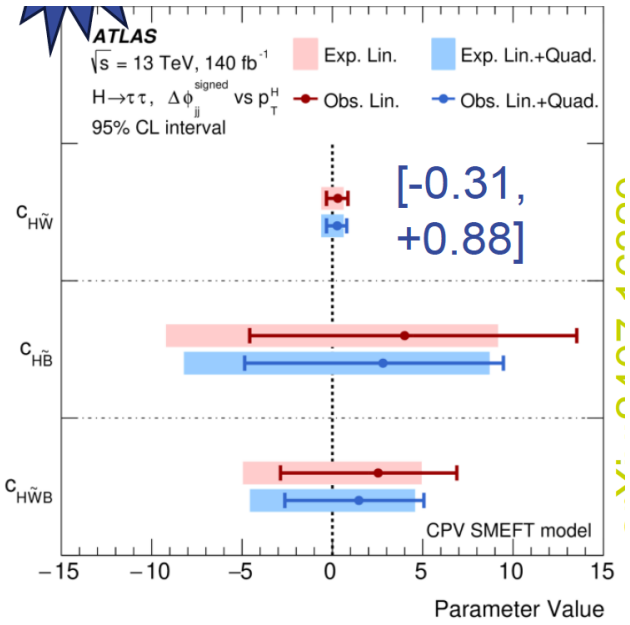


CPV operators in SMEFT

Combined $p_T(H)$



(VBF) H → ττ



H → WW