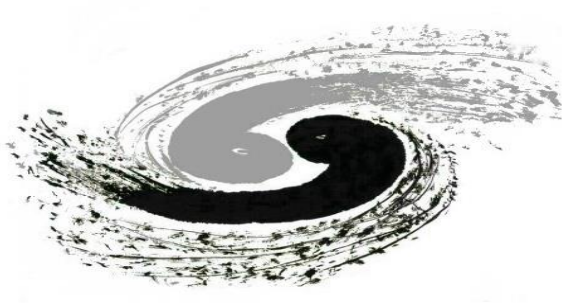

Weekly

Kaili

2019.09.23

ATLAS

- https://twiki.cern.ch/twiki/bin/view/Sandbox/BremFitinForward
  - Finished
  - I replied to Nicolas that I am willing to continue the work

- Shift undergoing

Higgs width, CEPC day

```
chisquarecepc10p[{kb_, kt_, kg_, kw_, ktau_, kz_, kgamma_, kmu_, ktotal_}, lumif_] :=
 Sum[((higgsobscepc10p360[kz, kw, kg, kgamma, kb, kt, ktau, kmu, ktotal][[i]] - 1) / higgs360cepc[[i]]) ((higgsobscepc10p360[kz, kw, kg, kgamma, kb, kt, ktau, kmu, ktotal][[j]] - 1) / higgs360cepc[[j]])
 求和
    inverseinputcorrelations360[[i, j]] / lumif, {i, 1, Length[higgs360cepc]}, {j, 1, Length[higgs360cepc]}] +
                                                  长度                          长度
  Sum[((higgsobscepc10p240[kz, kw, kg, kgamma, kb, kt, ktau, kmu, ktotal][[i]] - 1) / higgs240cepc[[i]]) ((higgsobscepc10p240[kz, kw, kg, kgamma, kb, kt, ktau, kmu, ktotal][[j]] - 1) / higgs240cepc[[j]])
  求和
    inverseinputcorrelations240[[i, j]] / lumif, {i, 1, Length[higgs240cepc]}, {j, 1, Length[higgs240cepc]}]
                                                  长度                          长度
```

	240GeV, 5.6ab^{-1}	360GeV, 2ab^{-1}	
	ZH	ZH	vvH
any	**0.50%**	**1%**	****
$H \to bb$	**0.27%**	**0.63%**	**0.76%**
$H \to cc$	**3.3%**	**6.2%**	**11%**
$H \to gg$	**1.3%**	**2.4%**	**3.2%**
$H \to WW$	**1.0%**	**2.0%**	**3.1%**
$H \to ZZ$	**5.1%**	**12%**	**13%**
$H \to \tau\tau$	**0.8%**	**1.5%**	**3%**
$H \to \gamma\gamma$	**5.4%**	**8%**	**11%**
$H \to \mu\mu$	**12%**	**29%**	**40%**
$\mathrm{Br}_{\mathrm{upper}}(H \to \mathrm{inv.})$	**0.2%**	****	****
$\sigma(ZH) * \mathrm{Br}(H \to Z\gamma)$	**16%**	**25%**	****
Width	**2.8%**	**1.44%**	

Reports given by Gang in CEPC day:
https://indico.ihep.ac.cn/event/10617/session/3/contribution/14/material/slides/1.pdf

We should combine the 240GeV and 360GeV together.
Standalone 360GeV only gives 2.8% for width.
While minimize the chi-square for both 240 and 360, the precision goes to 1.44%.

Fcc-ee Synergy

- Using Fcc-ee measurements with our method, gives 1.59%. While they claim 1.3%.
- This is due to the different definition in width, according to Jorge de Blas.
  - Reference: 1905.03764.
- We should use 10-kappaframework to calculate width
  - not only vvH->bb and ZZ channel.

Collider	$\delta\Gamma_H$ [%] from Ref.	Extraction technique standalone result	$\delta\Gamma_H$ [%] kappa-3 fit
ILC_{250}	2.3	EFT fit [3,4]	2.2
ILC_{500}	1.6	EFT fit [3,4,14]	1.1
ILC_{1000}	1.4	EFT fit [4]	1.0
$CLIC_{380}$	4.7	κ-framework [98]	2.5
$CLIC_{1500}$	2.6	κ-framework [98]	1.7
$CLIC_{3000}$	2.5	κ-framework [98]	1.6
CEPC	2.8	κ-framework [103,104]	1.7
FCC-ee_{240}	2.7	κ-framework [1]	1.8
FCC-ee_{365}	1.3	κ-framework [1]	1.1

- For conlusion, CEPC and Fcc-ee has comparable performance.

Other hints

- Powerful mathematica tools.
  - Testing the off-diagonal matrix effect about kappa
- Dimuon resolution could be changed from 0.3GeV to ~1.1GeV in 360GeV, according to Gang.
- To separate the ZH and vvH from the generator;
  - Compile and “close” one Feynman diagram from the configuration file.
- ZH, vvH->WW plays a role in calculation.
- (ZH, vvH->WW/ZZ for 4jets)