Status update FCC HH projections

What happened in the past few months

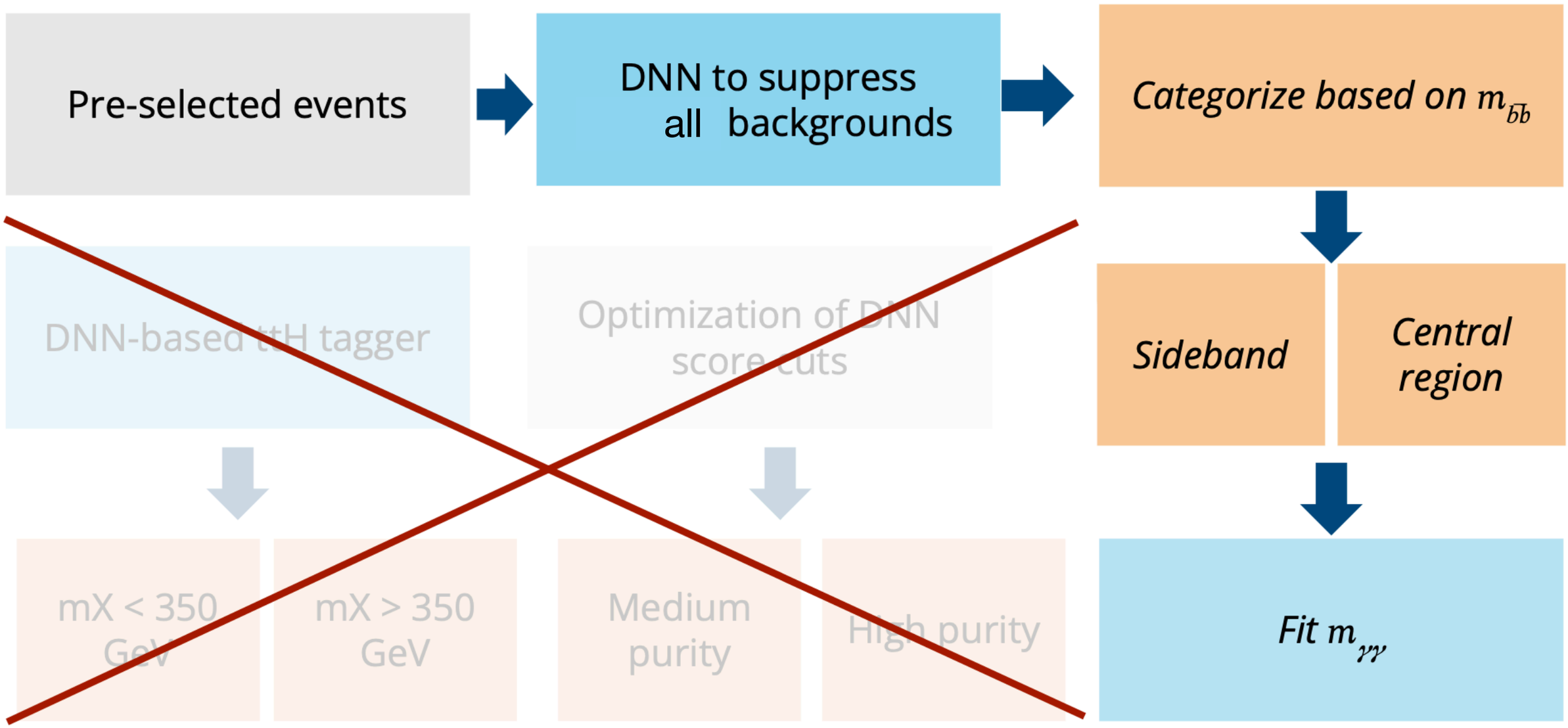
We were working on the production of new samples for 80TeV and 120 TeV center of mass energy:

- Signals: we used the new powheg model (and we validate the SM versus the previous old powheg version)
- Bkgs: we used MG

Find here some more details on the validation

We rerun the analysis for 80 and 120 TeV

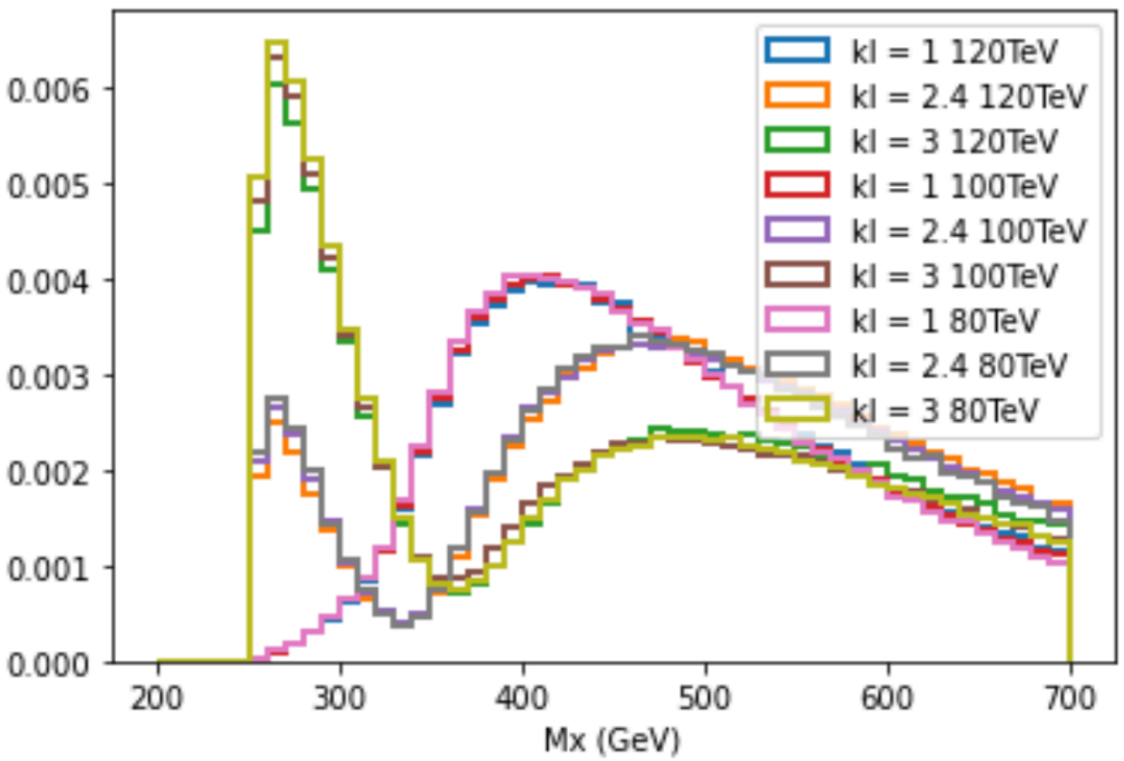
Analysis strategy quick recap

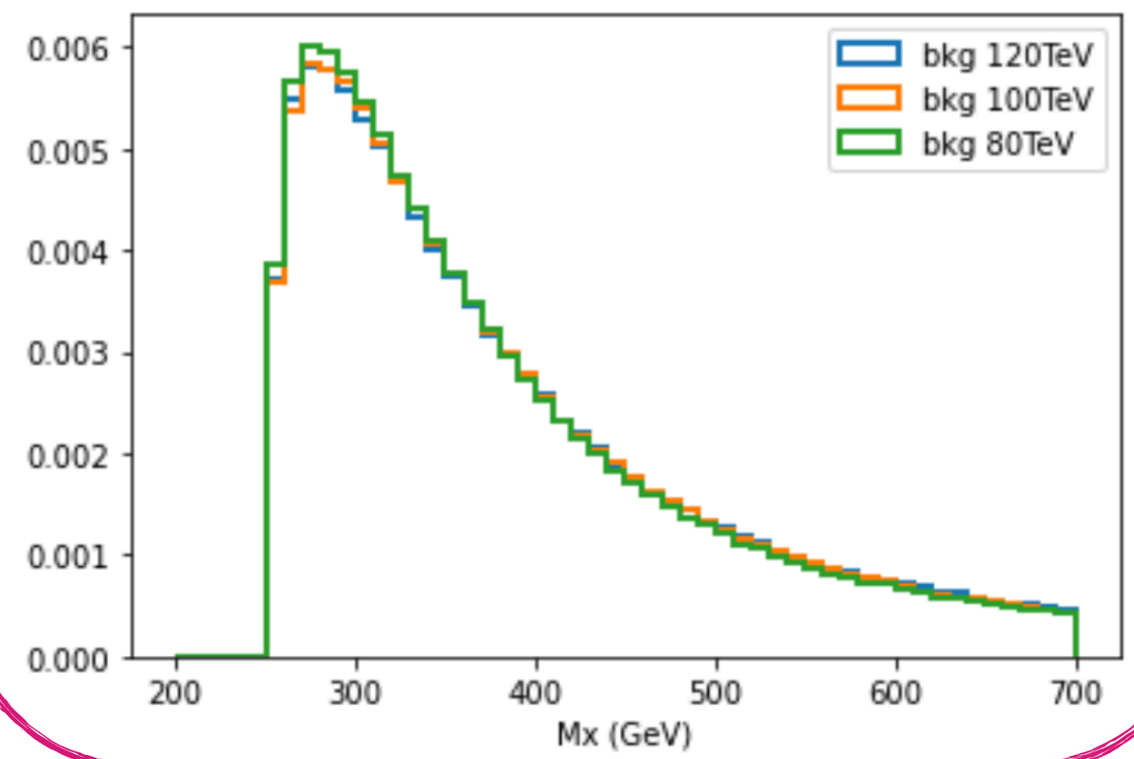


We rerun the same analysis for both energies

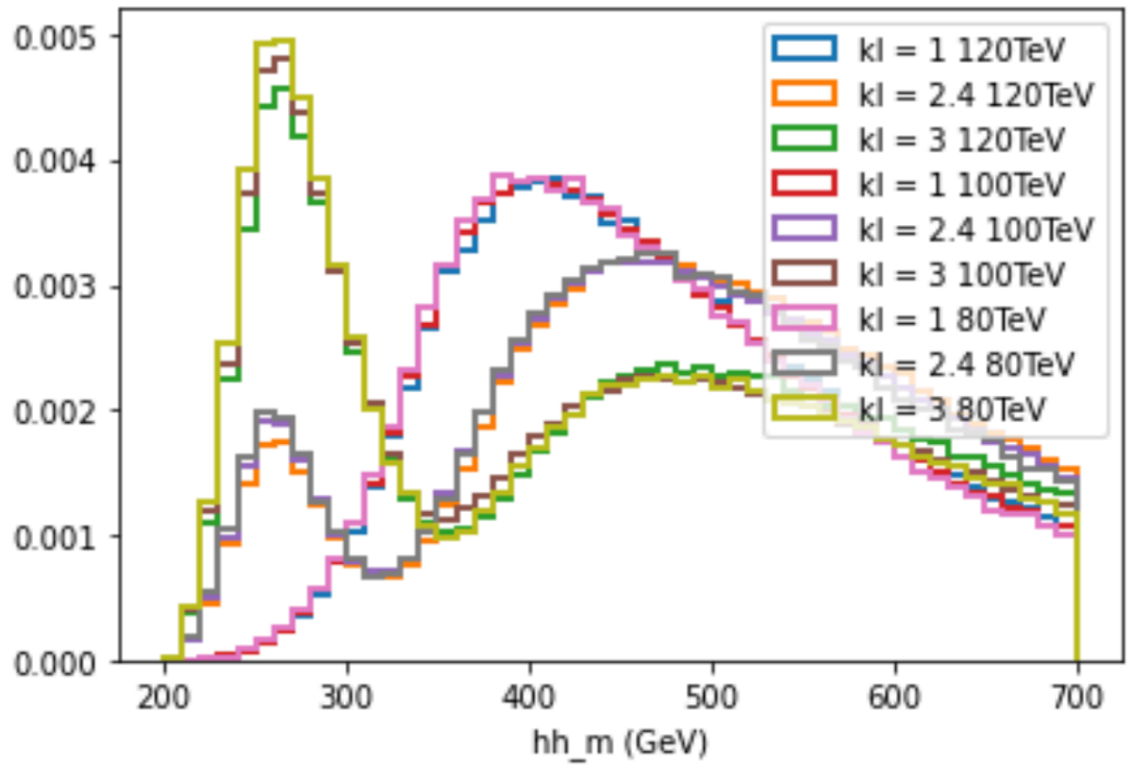
Some Distributions

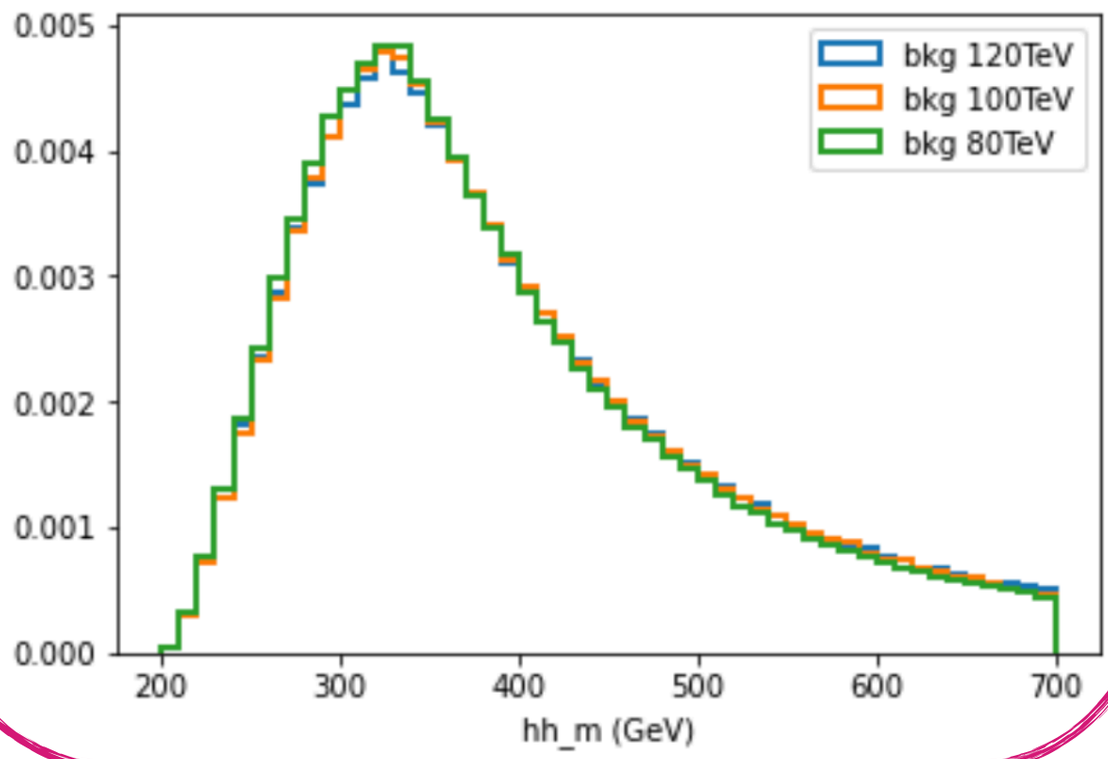
Mx variable





Mhh variable





Yields

	80 TeV	100 TeV	120 TeV
HH kl =1	16044.405	21808.143	28465.178
HH kl = 2.4	7232.403	9586.03	13050.125
HH kl = 3	7587.495	10098.628	13404.79
ttH	158868.16	230854.27	307189.47
Single H	175548.53	256043.5	71618.57
YYjj	1838698.6	2537151.8	3295658.2
VH	11842.319	15883.664	19819.8
VBF H	38658.47	54564.92	71618.57

Yields scaling as expected

Results

	80 TeV	100 TeV	120 TeV
No assumption on mbb	5% - stat only 6%	3.6% - stat only 3.2%	-
mbb res 10 GeV	3.6 - stat only 3.2	2.7% - stat only 2.5%	-
mbb res 5 GeV	2.9 - stat only 2.6	2.3% - stat only 2%	-
mbb res 3 GeV	2.7 - stat only 2.4	2% - stat only 1.8%	-

The expectation for 120TeV are very close to the 100TeV, we are investigating this