CEPC HZZ Project

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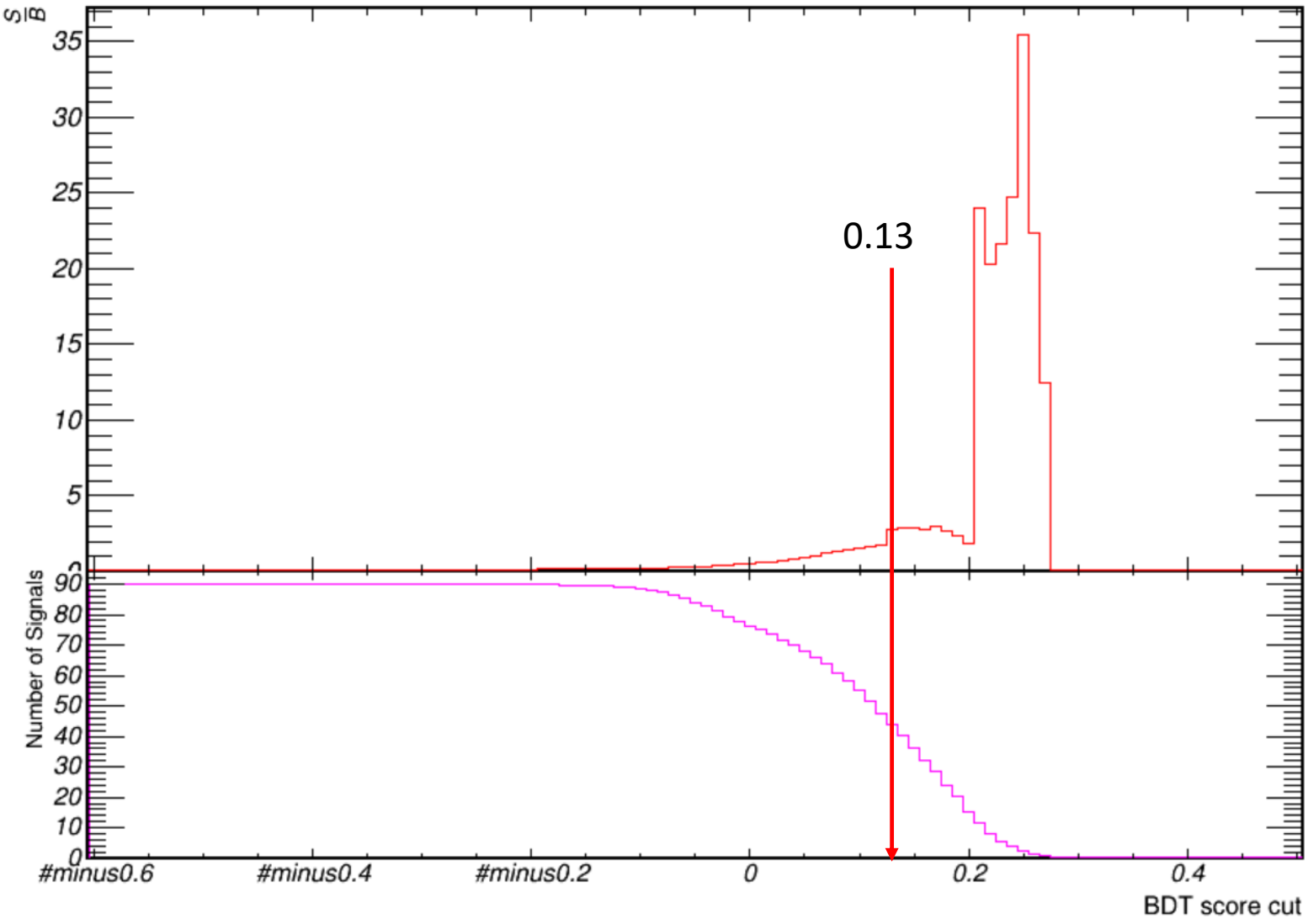
Project Overview

	mm(vvjj)	mm(jjvv)	vvHZZ	qq(vvmm)	qq(mmvv)
Cut-based	Done	Done	Done	Done	Done
Merge into framework	Done	Done	Done	Done	Done
BDT Study	Done	Done	Done	Done	Done
Put BDT code in package	Done	On-going	On-going	On-going	On-going
Higgs width fitting in the framework	Checking	Checking	Checking	Checking	Checking
Combined fitting	On-going				
Dalitz Fitting	To do				

	Status
Table & Plot style	Done
CEPC Memo	On-going
EFT	On-going (Ryuta)

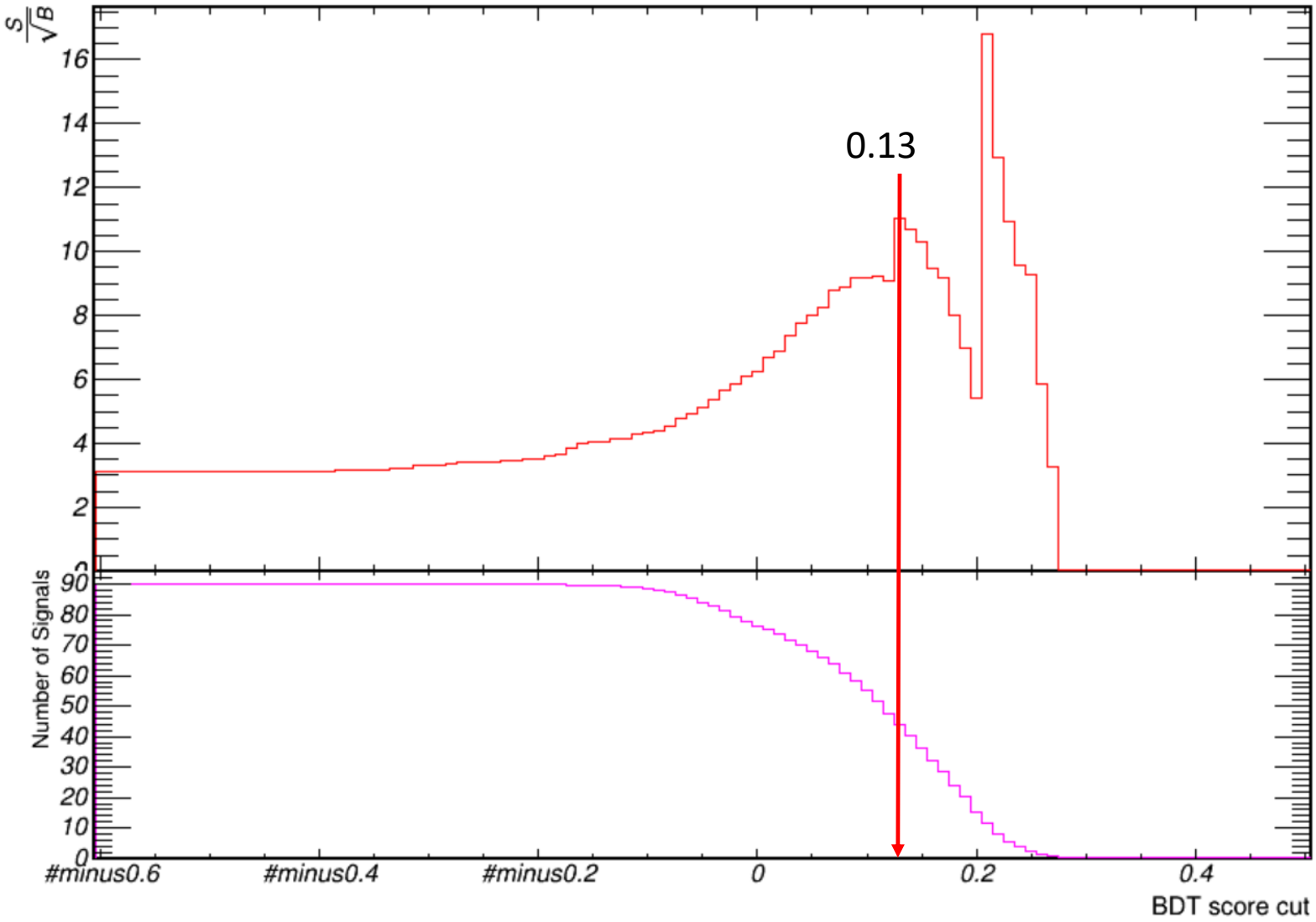
BDT on μμHZZ (vvjj)

- $\frac{S}{B}$



BDT on μμHZZ (vvjj)

- $\frac{S}{\sqrt{B}}$



BDT on μμHZZ (vvjj)

Cut-based

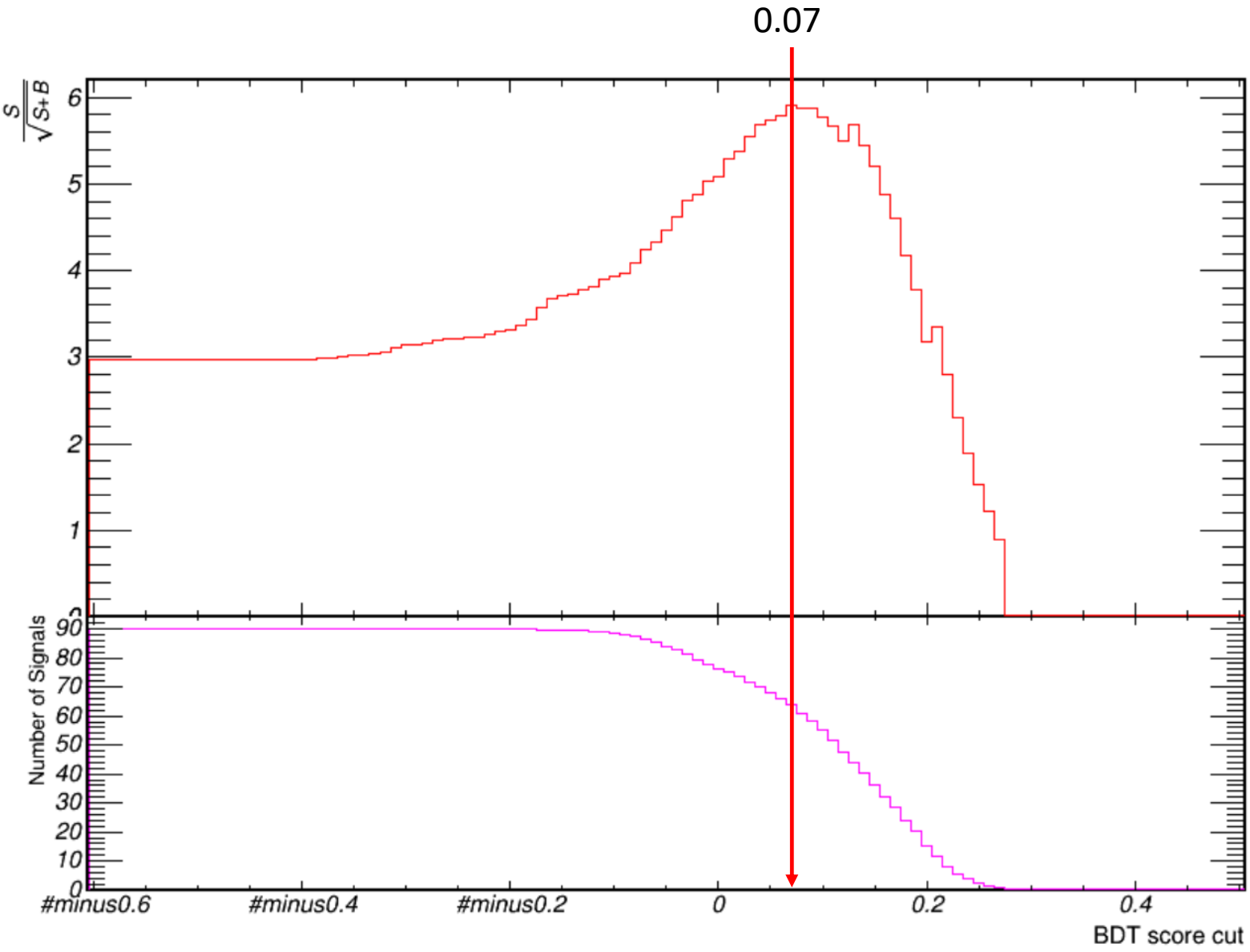
Cut	Signal	ZH background	2f background	4f background
Expected	1000	1140511	801811977	107203890
$Pre-selection$	616	30524	481301	515955
$Signal\ or\ not$	211	30307	481301	515955
$M_{missing} > M_{dijet}$	107	1605	115175	28838
M_{dimuon}	95	726	73813	6836
M^{rec}_{dimuon}	95	707	7894	1360
$N(pfo)$	94	336	3271	574
$Pt_{visible}$	89	312	342	168
$Angle_{min}$	85	298	283	139
$M_{missing}\ and\ M_{dijet}$	62	80	254	46
$Single\ Jet$	54	67	0	9

BDT

Cut	Signal	ZH background	2f background	4f background
$Expected$	1000	1140511	801811977	107203890
$Pre-selection$	616	30494	480828	515424
$Signal\ or\ not$	211	30282	480828	515424
$M_{missing} > M_{dijet}$	107	1608	115062	28811
M_{dimuon}	95	725	73741	6833
M^{rec}_{dimuon}	95	706	7886	1359
$N(pfo)$	94	336	3268	574
$Pt_{visible}$	89	312	342	168
$BDT\ score$	47	10	14	2

BDT on μμHZZ (vvjj)

- $\frac{S}{\sqrt{S+B}}$



BDT on μμHZZ (vvjj)

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$Pt_{visible}$	89	312	342	168
$BDT\ score$	66	36	14	11

Summary & Next to do

- **Finished the merging of first channel, the others should be finished soon**
- **Send samples to Kaili to determine which cut is better**
- **Discuss combined fitting in the framework with Kaili further**