

$H \rightarrow \pi_\nu (\rightarrow b\bar{b}) \pi_\nu (\rightarrow b\bar{b})$ at 350 GeV

analysis summary

Mateusz Goncerz

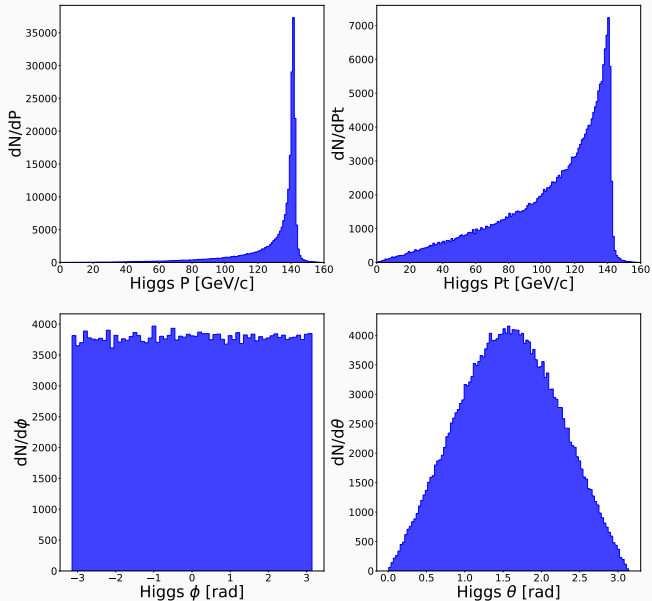
Marcin Kucharczyk

- updates:
 - added Z boson candidate reconstruction using two jets not assigned to the Higgs four-jet
 - mass used as TMVA variable
 - small improvement in signal-background separation
 - analysis finished
 - publication draft ready
- last presentations (same, but no Z):
 - https://indico.cern.ch/event/1142123/contributions/4802798/attachments/2416364/4134937/CLIC_HVHiggs_6.pdf
 - https://indico.cern.ch/event/1161420/contributions/4878014/attachments/2448947/4196635/CLIC_HVHiggs_ul.pdf

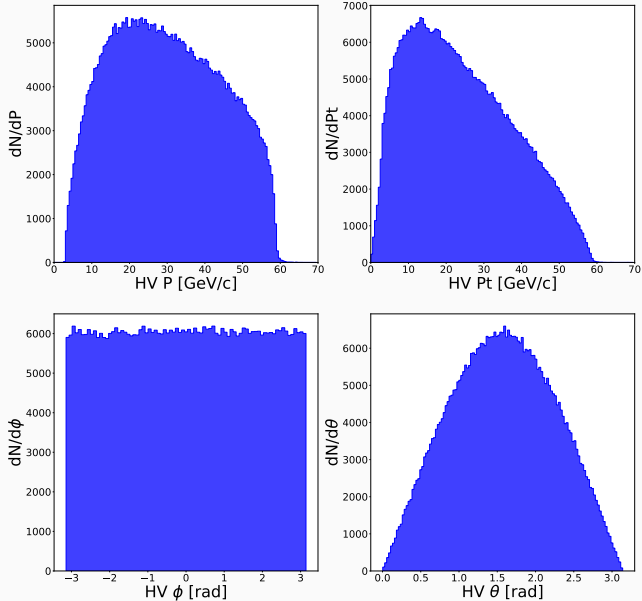
samples

description	ID	σ [fb]	# events	≥ 2 DV events [%]
25 GeV, 1 ps	10953	93.44	~ 240 K	78
25 GeV, 10 ps	10944	93.44	~ 240 K	94
25 GeV, 100 ps	10932	93.44	~ 240 K	99
25 GeV, 300 ps	10962	93.44	~ 240 K	97
35 GeV, 1 ps	10956	93.44	~ 240 K	76
35 GeV, 10 ps	10947	93.44	~ 240 K	93
35 GeV, 100 ps	10453	93.44	~ 240 K	99
35 GeV, 300 ps	10965	93.44	~ 240 K	98
50 GeV, 1 ps	10959	93.44	~ 240 K	72
50 GeV, 10 ps	10950	93.44	~ 240 K	89
50 GeV, 100 ps	10935	93.44	~ 240 K	99
50 GeV, 300 ps	10968	93.44	~ 240 K	99
qq	4698	24405.4	~ 2 KK	12
qqqq	2871	5847	~ 1.44 KK	8
qq $\nu\nu$	2862	324.6	~ 306 K	12
WWZ	1439	10	~ 40 K	14
$t\bar{t}$	1369+1434	450	$\sim(21+220)$ K	12

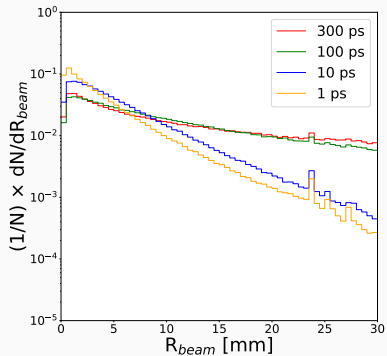
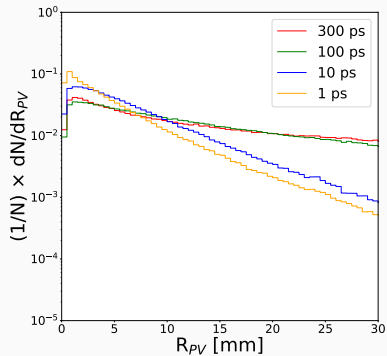
Higgs



Hidden Valley pions (35 GeV, 10 ps)

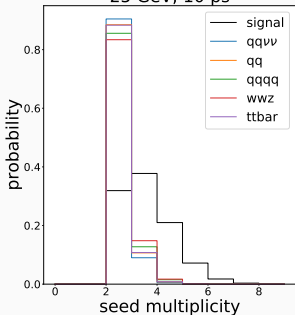


displaced vertices (35 GeV)

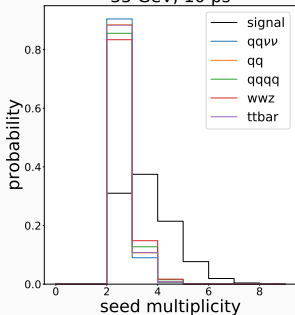


TMVA – variables

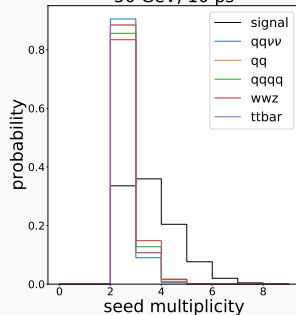
25 GeV, 10 ps



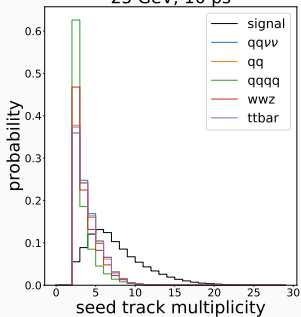
35 GeV, 10 ps



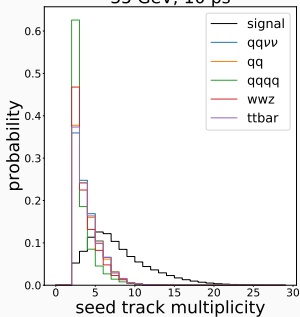
50 GeV, 10 ps



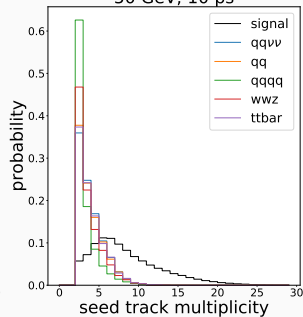
25 GeV, 10 ps



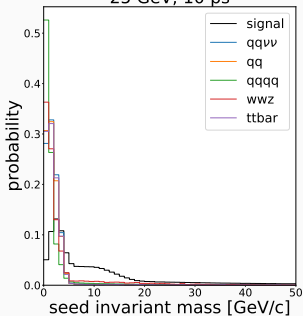
35 GeV, 10 ps



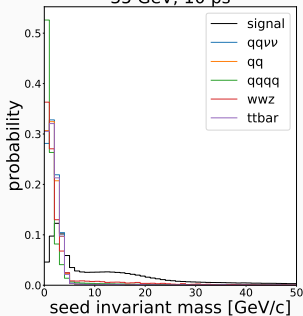
50 GeV, 10 ps



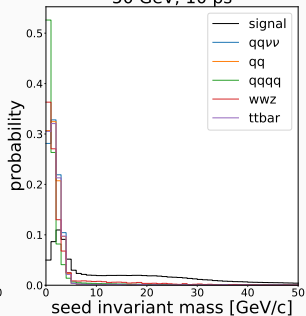
25 GeV, 10 ps



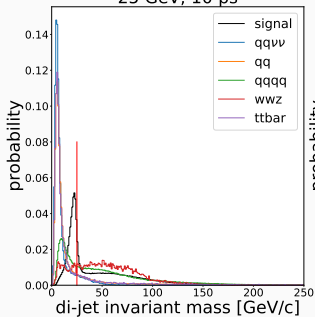
35 GeV, 10 ps



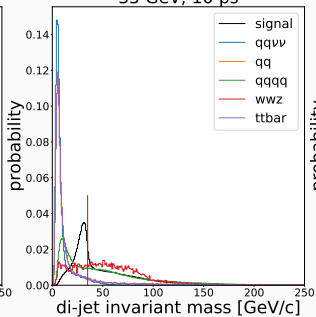
50 GeV, 10 ps



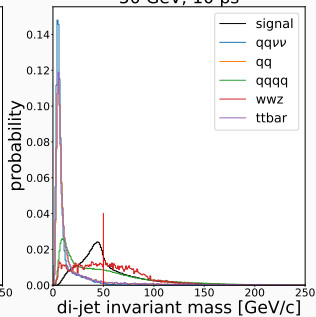
25 GeV, 10 ps

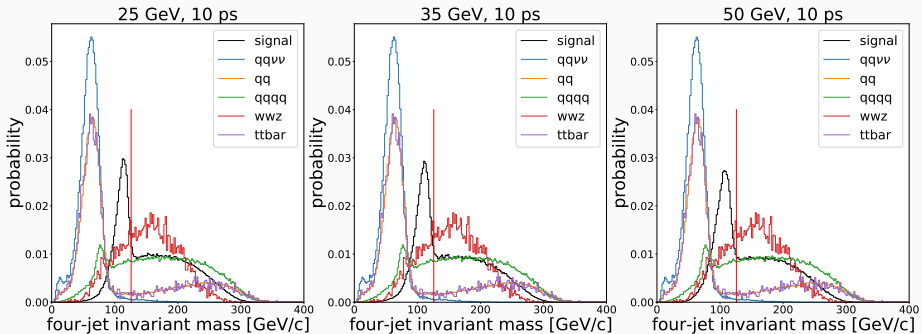


35 GeV, 10 ps

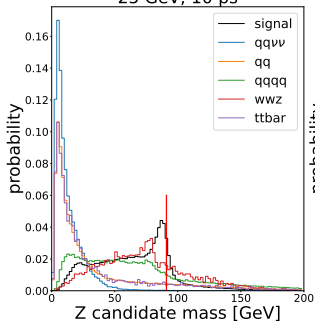


50 GeV, 10 ps

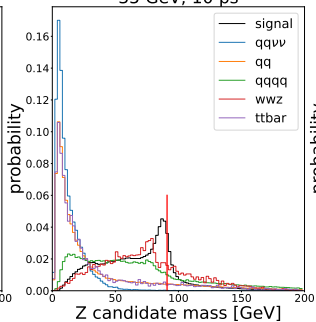




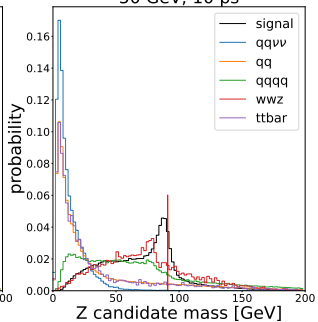
25 GeV, 10 ps



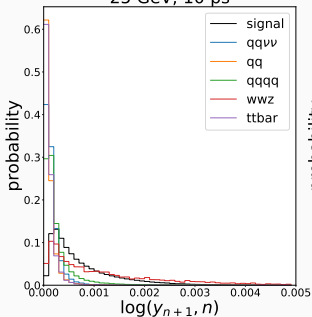
35 GeV, 10 ps



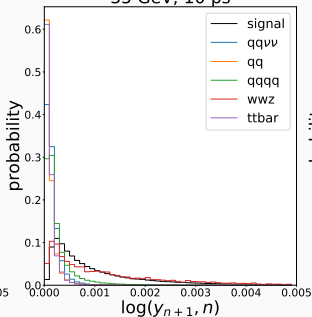
50 GeV, 10 ps



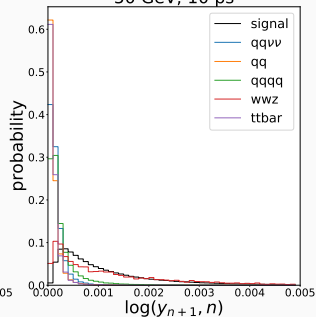
25 GeV, 10 ps

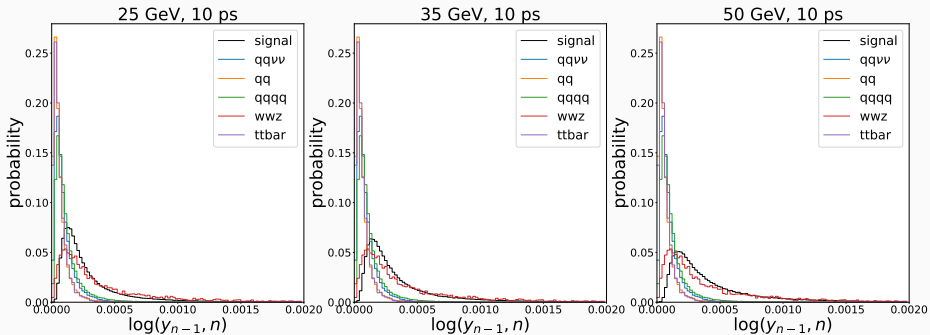


35 GeV, 10 ps

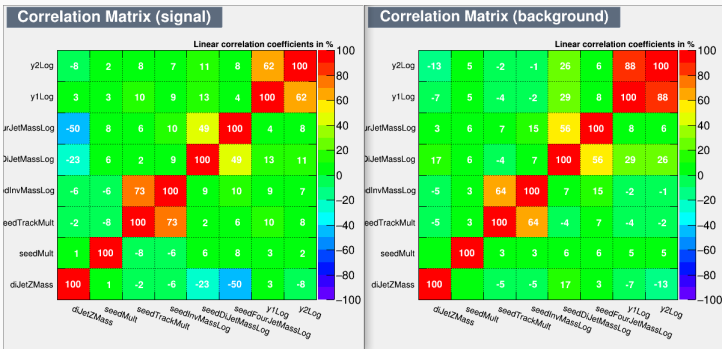


50 GeV, 10 ps



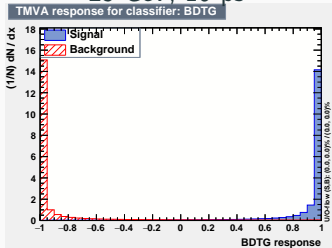


- 35 GeV, 10 ps signal and combined background

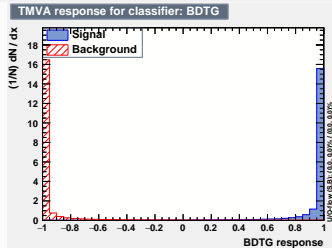
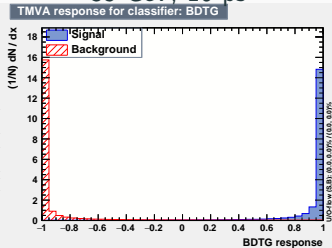


TMVA – BDT response

25 GeV, 10 ps

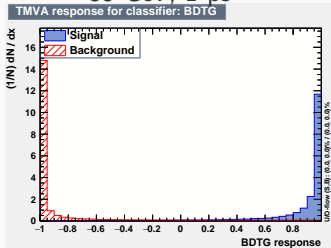


35 GeV, 10 ps

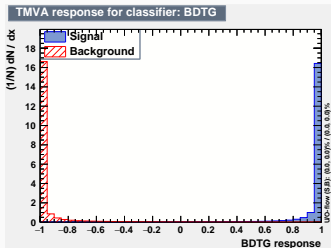
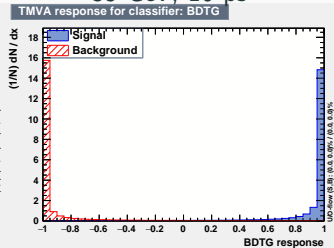


50 GeV, 10 ps

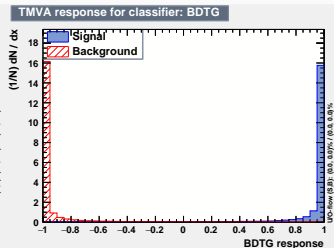
35 GeV, 1 ps



35 GeV, 10 ps

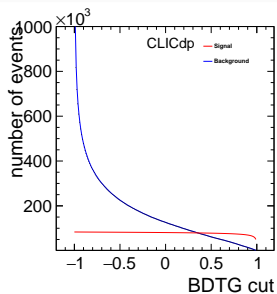
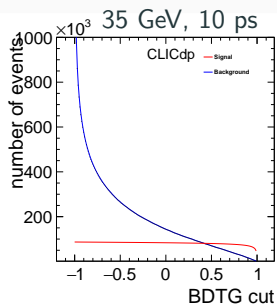
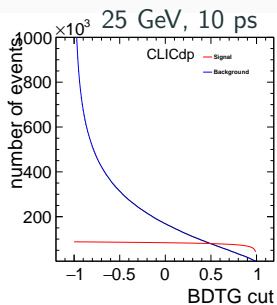


35 GeV, 100 ps

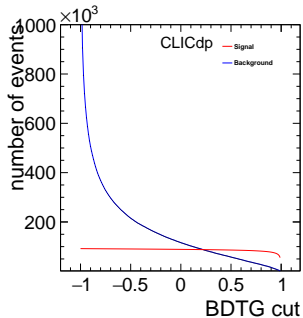
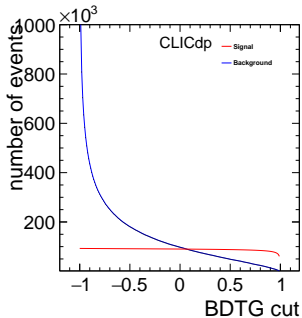
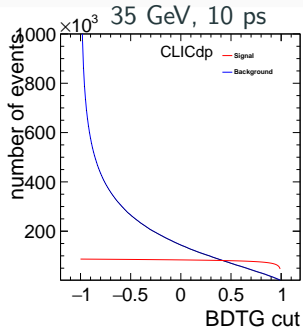
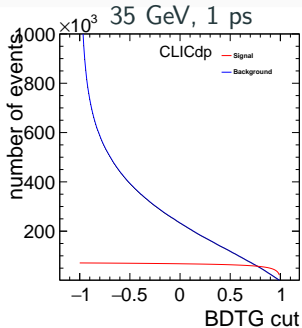


35 GeV, 300 ps

TMVA – number of events



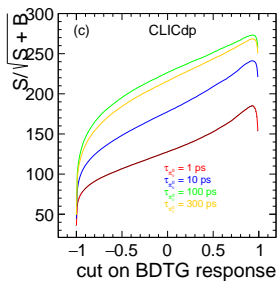
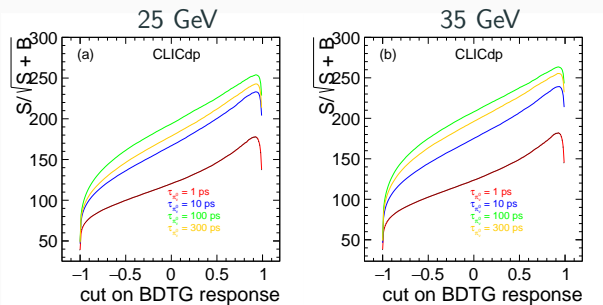
50 GeV, 10 ps



35 GeV, 100 ps

35 GeV, 300 ps

TMVA – significance



50 GeV

upper limits

