
Run15 pp BHT1*VPDMB-30 &
BHT2*BBCMB QA (Bad Run Tagging)

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General Information

BHT1*VPDMB-30

- Data sets: picoDst of Run15 p+p @ 200 GeV
- "catalog:star.bnl.gov?production=P16id,trgsetupname=production_pp200trans_2015||production_pp200long_2015||production_pp200long2_2015||production_pp200long3_2015,filename~st_physics,filetype=daq_reco_picoDst,runnumber[]16045082-16117019,storage=NFS"
- Trigger Type:
 - BHT1*VPDMB-30
 - BHT1*VPDMB-30-nobsmd
- Trigger Ids: 32 470202 470206 480202 480206 490202 490206
- Cut:
 - $|Vztpc| < 30$
 - $|Vzvpd - Vztpc| < 6$
 - $|vr| < 2$
 - Ranking > 0

BHT2*BBCMB

- Data sets: picoDst of Run15 p+p @ 200 GeV
- "catalog:star.bnl.gov?production=P16id,trgsetupname=production_pp200trans_2015||production_pp200long_2015||production_pp200long2_2015||production_pp200long3_2015,filename~st_physics,filetype=daq_reco_picoDst,runnumber[]16044110-16117019,storage=NFS"
- Trigger Type: BHT2*BBCMB
- Trigger Ids: 470205 480205 490205
- Cut:
 - $|Vztpc| < 70$
 - $|vr| < 2$
 - Ranking > 0

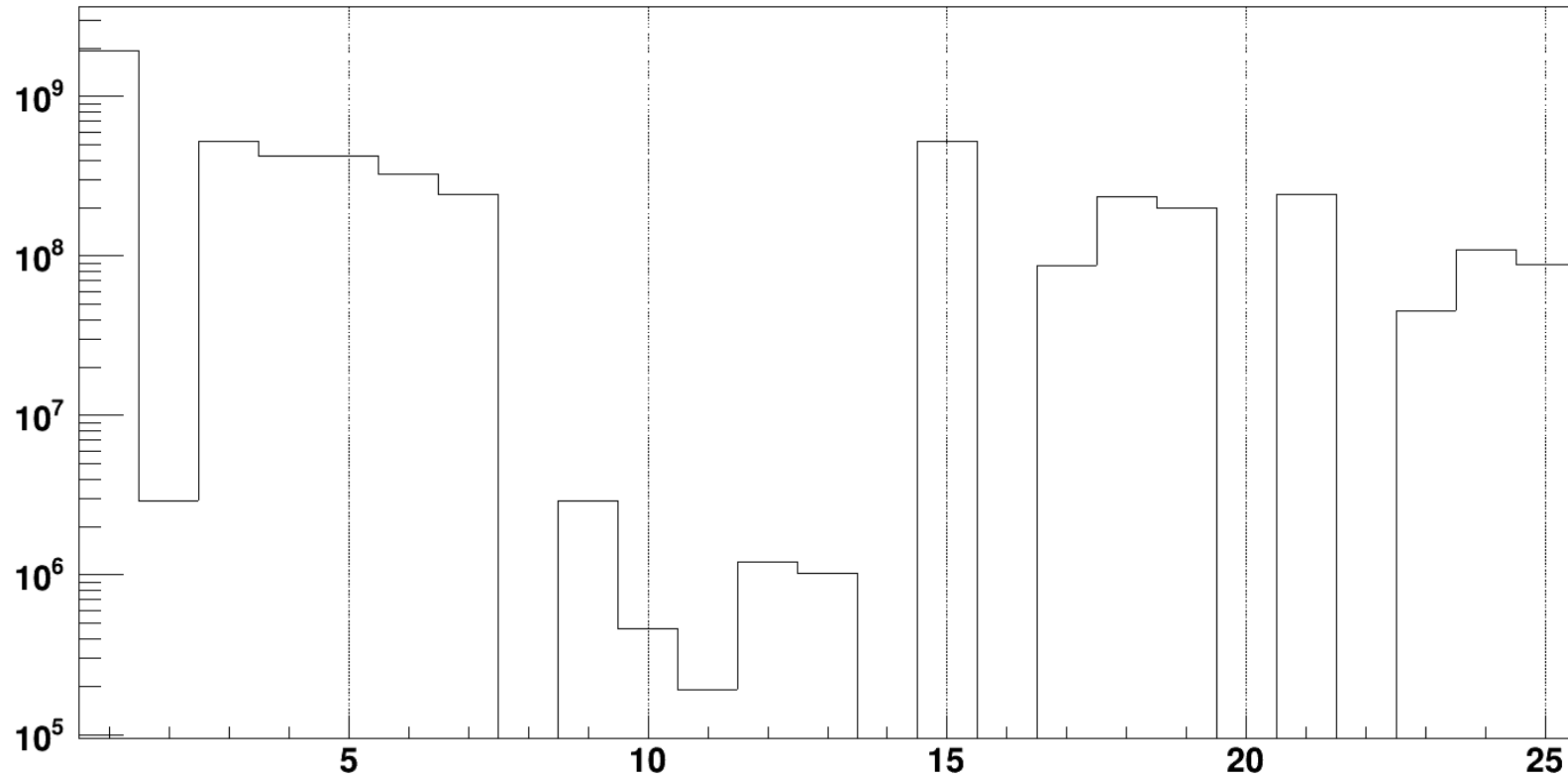
Fast Tag (Auto Selection)

- 42 TH2 (v vs RunIdx)
- TH2 \rightarrow ProfileX \rightarrow TH1 ($\langle v \rangle$ vs RunIdx)
- In each “tagging round”
 - For different TH1
 - Break up RunIdx into several range based on TPCVx and TPCVy
 - Fit each range to a linear function: $\langle v \rangle = a * \text{RunIdx} + b$ (option “W”)
 - Shift $\langle v \rangle$ in this range by $-b$
 - Rotate the axis $XO'Y$ by $\arctan(a)$ to $X'O'Y'$
 - Consider them as “points” instead of histograms
 - Calculate standard deviation of y' coordinate in $X'O'Y'$: $\sigma(y')$
(The mean value of y' is 0 due to option “W”, the $\langle v \rangle$ shift and rotation)
 - Find any point falls out of $y' \pm \sigma(y') * \text{width}$ (width = 5); tag the corresponding RunIdx
 - Repeat this in all ranges; this is the tagging process in a single round with a single TH1
 - After tagging RunIdx with all TH1, empty any bin which has a tagged RunIdx (in all TH1)
- Go into next round until in a new round, no new RunIdx is tagged

Manual Selection

- Exclude points VERY suspicious (satisfy one of the following)
 - 1. Close to the band boundary and does not follow trend nearby
 - 2. The existence of which vastly changes the slope of fitting in that range
 - 3. Within a range, large fluctuation and large error bar in for several sequence of Runs
- Tag those runs before entering the auto selection loop

BHT1*VPDMB-30 EvtCounter



Bin 1: Total Events

Bin 2: VPDMB-30

Bin 3: BHT1*VPDMB-30

Bin 4: Vztpc

Bin 5: vr

Bin 6: dvz

Bin 7: Ranking

Bin 9: VPDMB-30 All

Bin 10: VPDMB-30 1

Bin 11: VPDMB-30 2

Bin 12: VPDMB-30 3

Bin 13: VPDMB-30 4

Bin 15: BHT1*VPDMB-30 All

Bin 16: **BHT1*VPDMB-30 1**

Bin 17: BHT1*VPDMB-30 2

Bin 18: BHT1*VPDMB-30 3

Bin 19: BHT1*VPDMB-30 4

Bin 21: BHT1*VPDMB-30 All (cut)

Bin 22: **BHT1*VPDMB-30 1 (cut)**

Bin 23: BHT1*VPDMB-30 2 (cut)

Bin 24: BHT1*VPDMB-30 3 (cut)

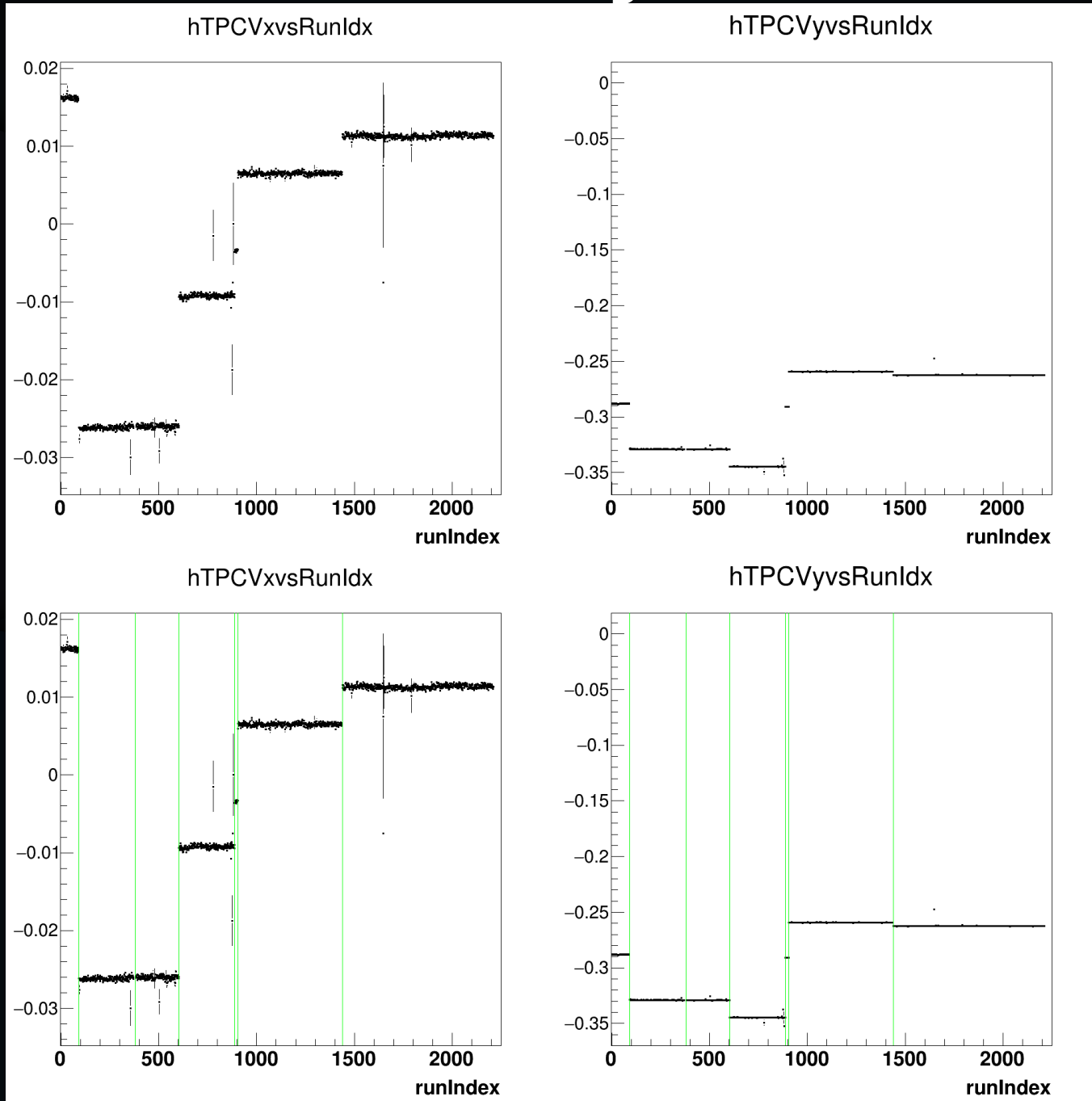
Bin 25: BHT1*VPDMB-30 4 (cut)

Total number of BHT1*VPDMB-30: 5.22×10^8

STAR Trigger webpage: BHT1*VPDMB-30 nobsmd effective: 535.533million

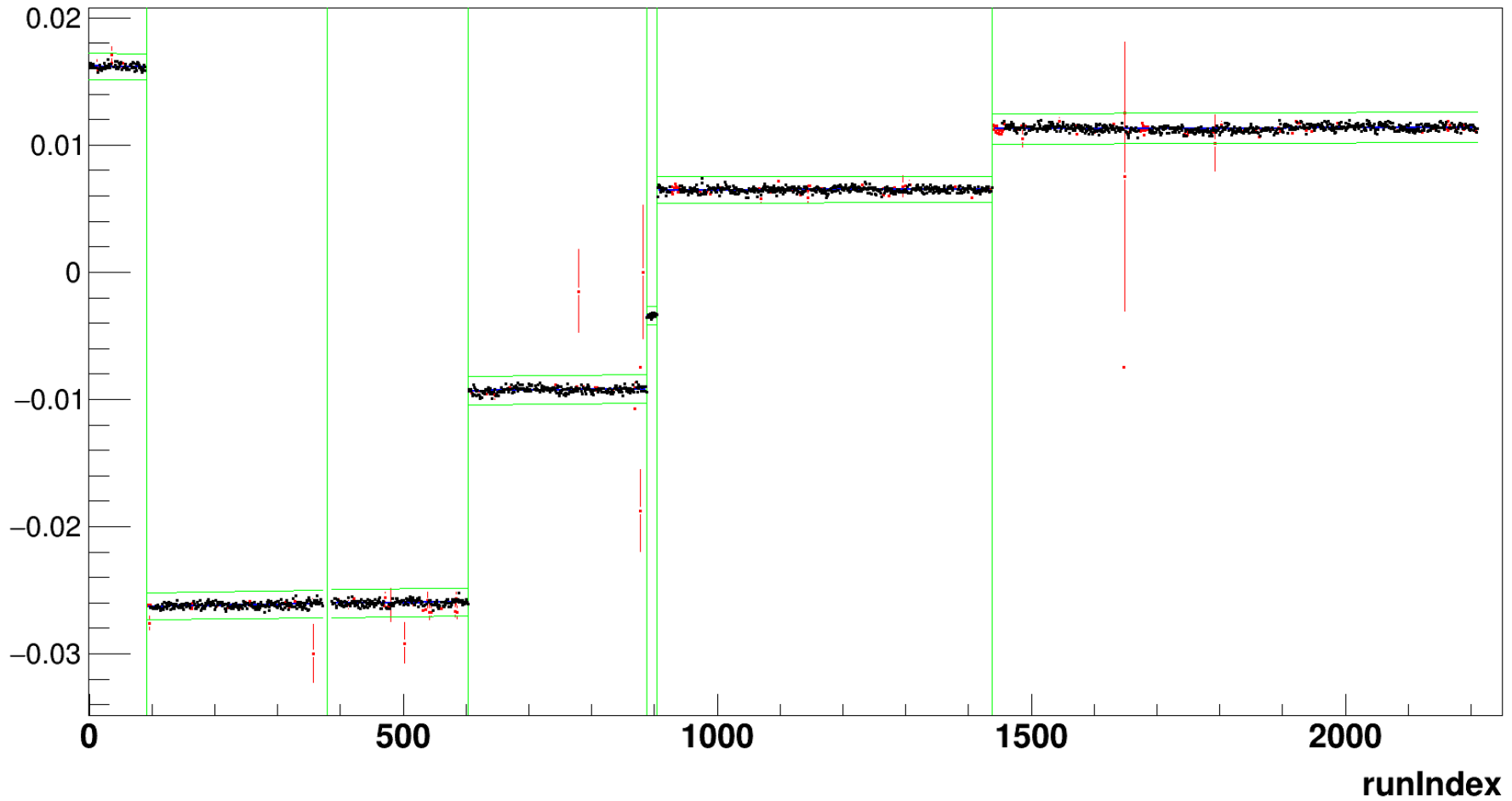
(Around 13 million less)

TPCVx & TPCVy vs RunIdx



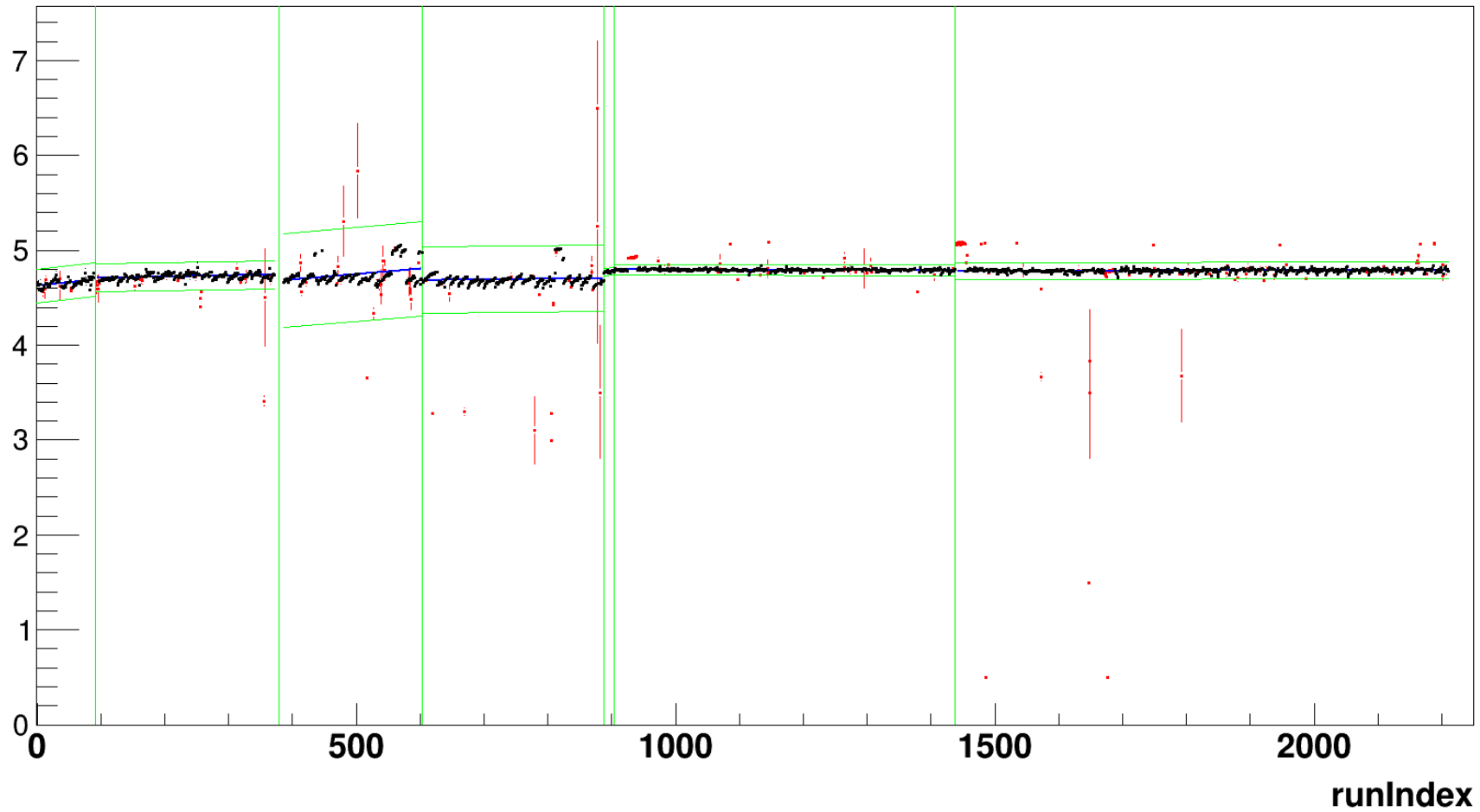
Fast Tag Example

hTPCVxvsRunIdx



Fast Tag (Example)

hnBEMCMatchvsRunIdx



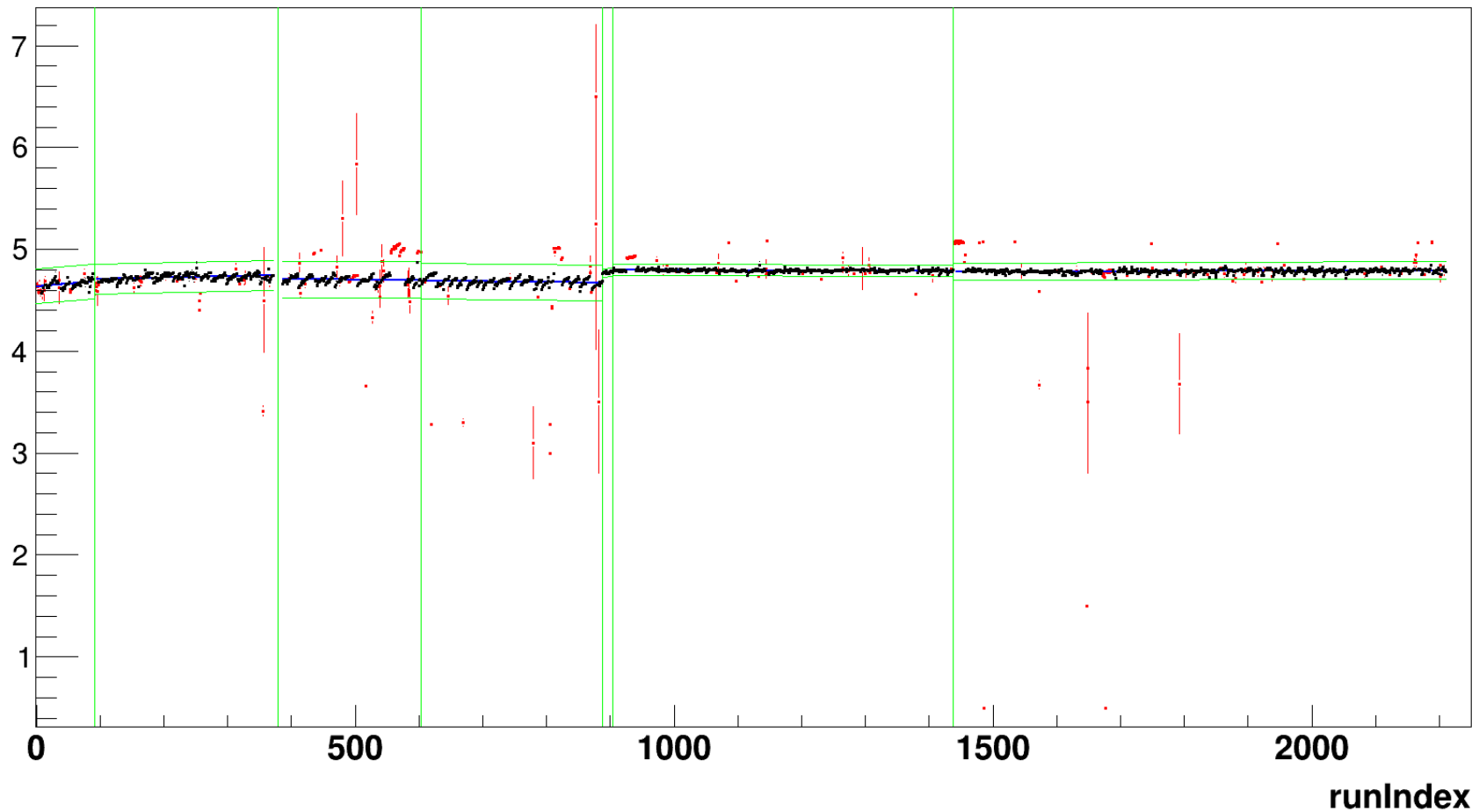
Manual Selection

Manually Tagged RunIdx:

- 0~7, 434~436, 446, 491~503,
556~558, 560, 562~575, 577, 598,
599, 603, 812, 814~820, 823, 824

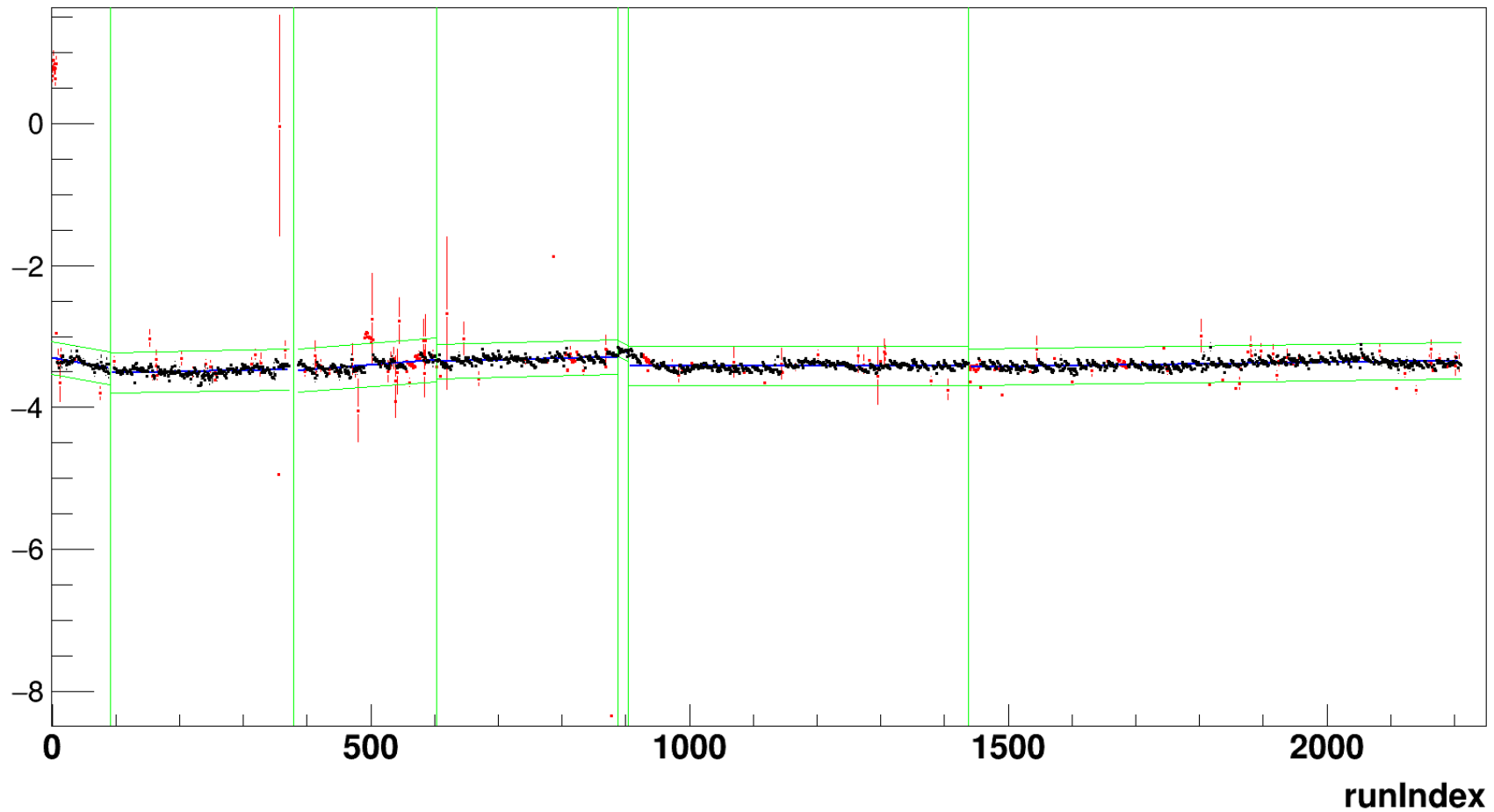
Manually Tag Example

hnBEMCMatchvsRunIdx



See all in folder

hTrgdNSigmaEvsRunIdx



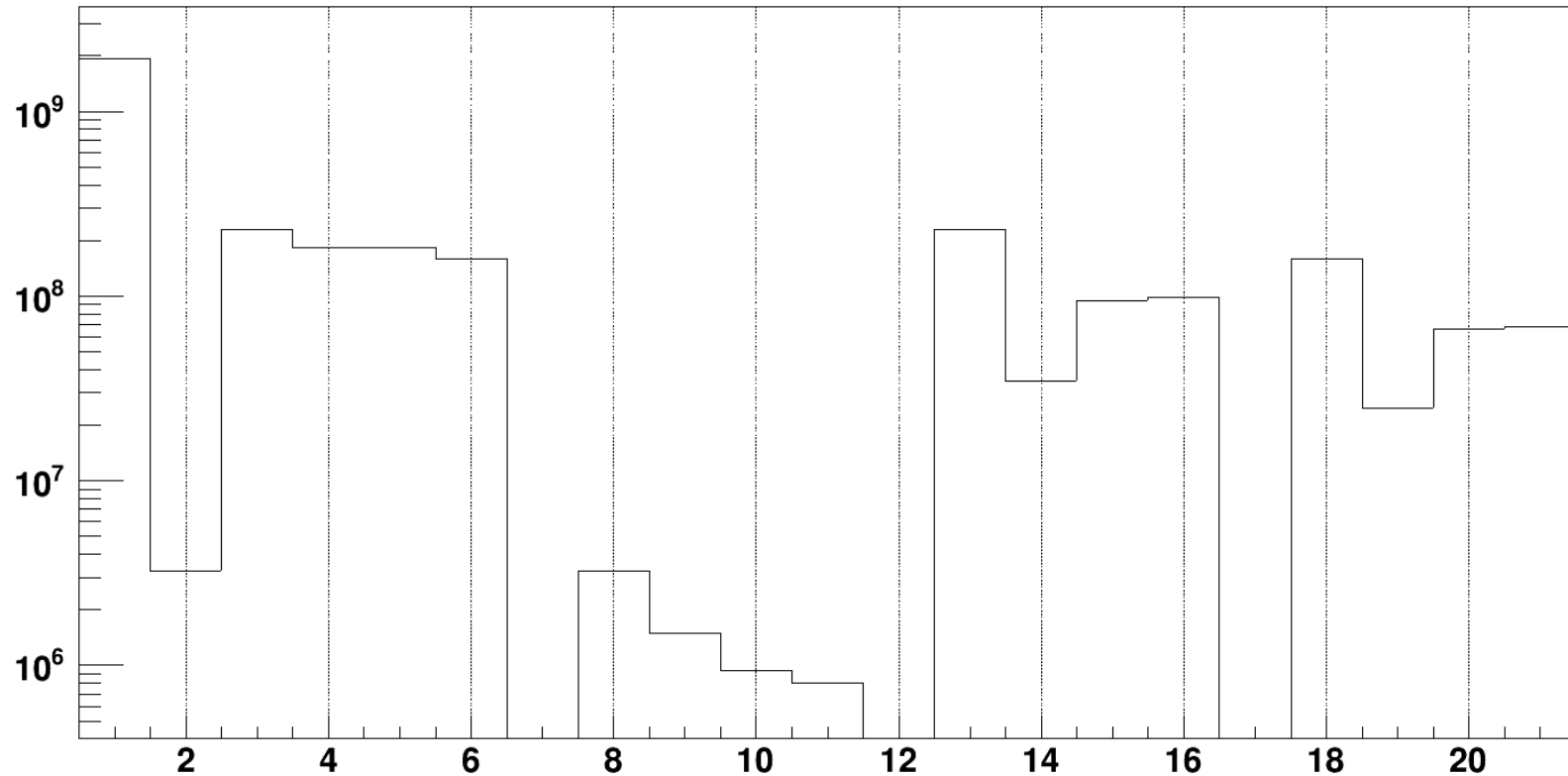
Bad Runs Tagged by BHT1*VPDMB-30

- Total “round” of tagging: 5 (the 6th round does not tag anything)

- Bad Run Number: (267/2211 tagged)

- 16045082 16045083 16045084 16045085 16045086 16045087 16045088 16045089 16045093 16045096 16045097
16046003 16046005 16046032 16046033 16046034 16046064 16047101 16047102 16047103 16047104 16047106
16050036 16050041 16050048 16050049 16050050 16050051 16051046 16051106 16052013 16052036 16052043
16052048 16052051 16052087 16052088 16054018 16054061 16054073 16054074 16055124 16055127 16056004
16058007 16058072 16058073 16058083 16059008 16059009 16059010 16059023 16060018 16060028 16060036
16060053 16060054 16060055 16060056 16060057 16060058 16060059 16060060 16060061 16060062 16060063
16060064 16060065 16061035 16061076 16062001 16062005 16062008 16062009 16062011 16062014 16062045
16062046 16062047 16062049 16062050 16062051 16062052 16062053 16062054 16062055 16062056 16062057
16062058 16062078 16063001 16063002 16063003 16063004 16063005 16063006 16063007 16063096 16063097
16063099 16064014 16064016 16064020 16064082 16065011 16065036 16065059 16066028 16068043 16069040
16069045 16069060 16071001 16071002 16071006 16071007 16071018 16071020 16071021 16071022 16071023
16071024 16071025 16071026 16071027 16071045 16071046 16071060 16071076 16072046 16072047 16072057
16073004 16073007 16073015 16078001 16078002 16078003 16078004 16078005 16078006 16078007 16078008
16078009 16078010 16078011 16078012 16078013 16078014 16079026 16079037 16079045 16079051 16080012
16080043 16082011 16082014 16082045 16083003 16083044 16084003 16084016 16084017 16084018 16085005
16085034 16086029 16087018 16088014 16088015 16088024 16088039 16089002 16089014 16089021 16089023
16091050 16092040 16093015 16093064 16093065 16093066 16093067 16093070 16093072 16093074 16093075
16093076 16093077 16094001 16094002 16094003 16094004 16094005 16094017 16094018 16095005 16095025
16095027 16095031 16096019 16096030 16097028 16097029 16098007 16099033 16100023 16100024 16100025
16100069 16101002 16101003 16101004 16101005 16101006 16101007 16101008 16101009 16101010 16101011
16101012 16101013 16101014 16101015 16101016 16101057 16102053 16102059 16102060 16103051 16104002
16104022 16104046 16105044 16106024 16106031 16106033 16107004 16107008 16107011 16107042 16107054
16108016 16108026 16108030 16108034 16108045 16109006 16109015 16110005 16113009 16113054 16114032
16115031 16115056 16116015 16116016 16116017 16116018 16116020 16116021 16116036 16116048 16116049
16117008 16117009 16117015

BHT2*BBCMB EvtCounter



Bin 1: Total Events

Bin 2: BBCMB

Bin 3: BHT2*BBCMB

Bin 4: Vztpc

Bin 5: vr

Bin 6: Ranking

Bin 8: BBCMB All

Bin 9: BBCMB 1

Bin 10: BBCMB 2

Bin 11: BBCMB 3

Bin 13: BHT2*BBCMB All

Bin 14: BHT2*BBCMB 1

Bin 15: BHT2*BBCMB 2

Bin 16: BHT2*BBCMB 3

Bin 18: BHT2*BBCMB All (cut)

Bin 19: BHT2*BBCMB 1 (cut)

Bin 20: BHT2*BBCMB 2 (cut)

Bin 21: BHT2*BBCMB 3 (cut)

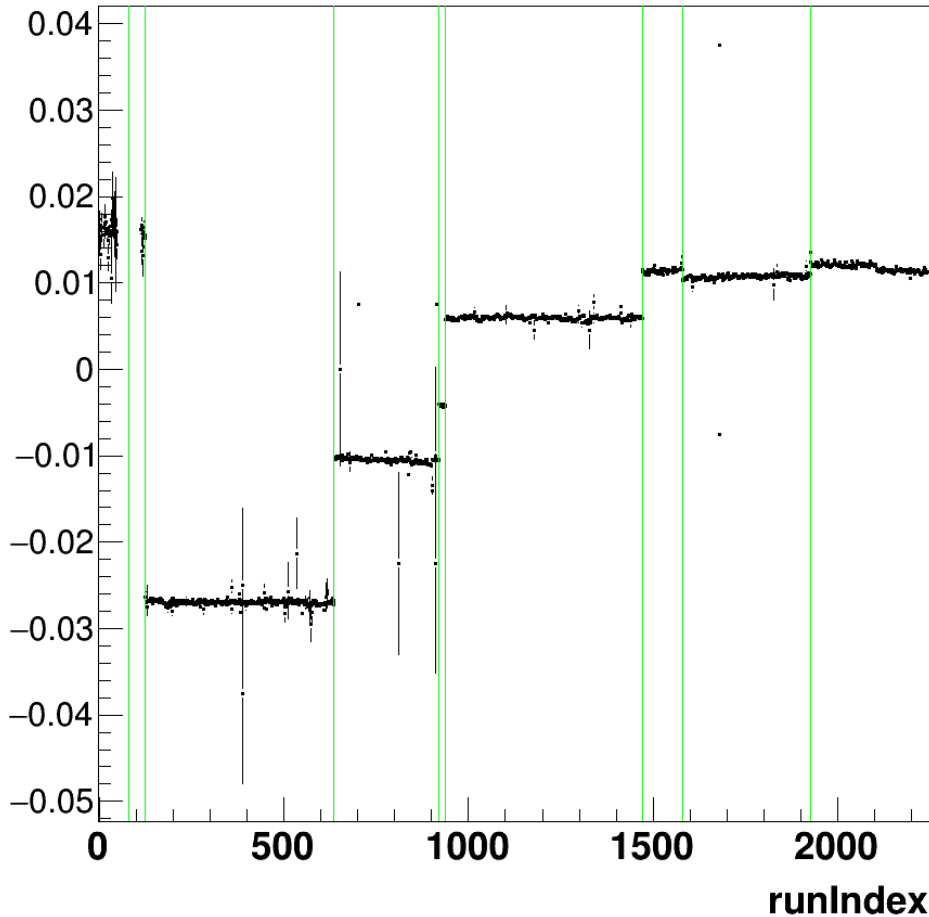
Total number of BHT2*BBCMB: 2.28×10^8

STAR Trigger webpage: BHT2*BBCMB: 234.737million

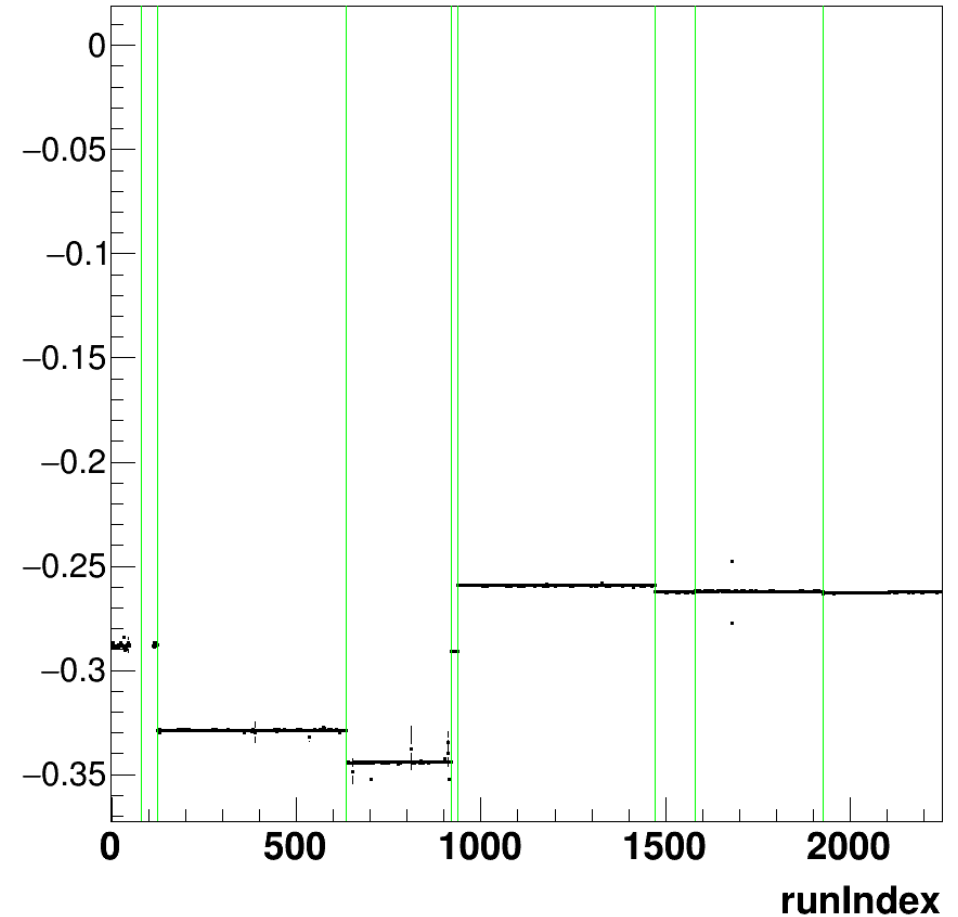
(Around 7 million less)

BHT2*BBCMB

hTPCVxvsRunIdx



hTPCVyvsRunIdx



For the first tens of runs, due to large fluctuation in most $\langle v \rangle$, as well as short range making the trend very unclear, remove all of them

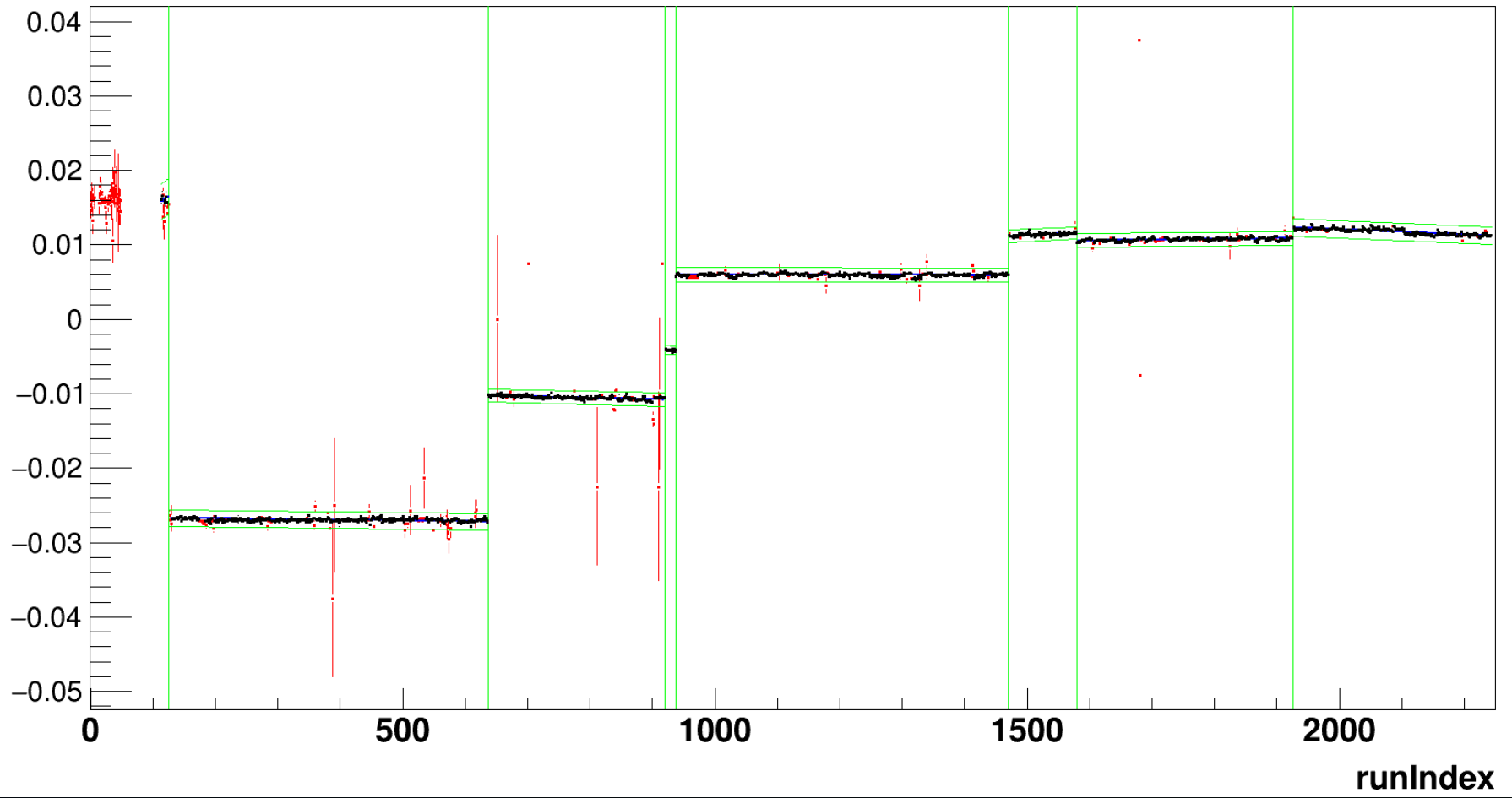
Manual Selection

Manually Tagged RunIdx:

- 0~49, 524~533, 1705~1719 (except 1709), 123~125, 116~118, 174~183, 959~972, 1616

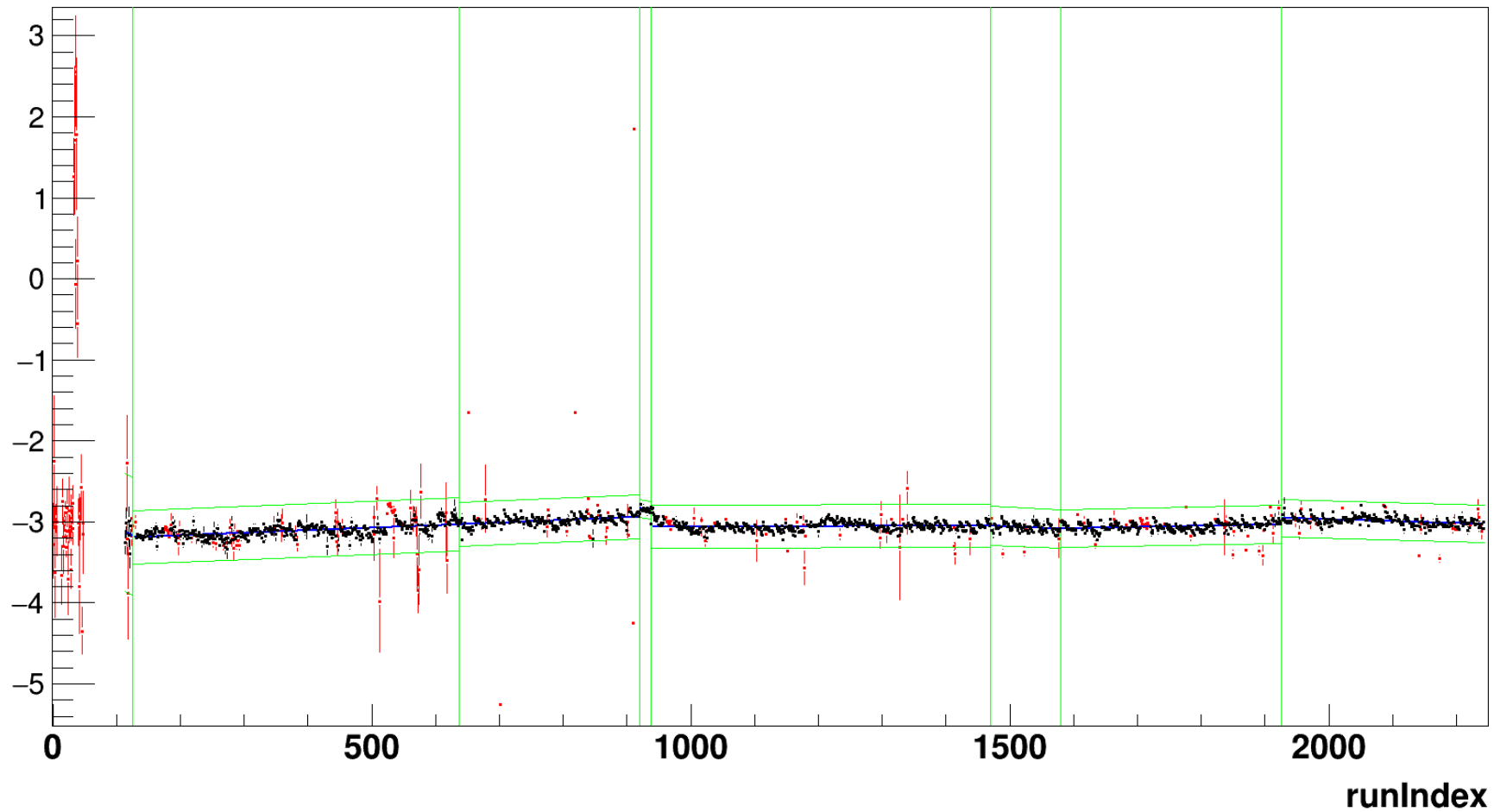
Manually Tag Example

hTPCVxvsRunIdx



See all in the folder

hTrgdNSigmaEvsRunIdx



Bad Runs Tagged by BHT2*BBCMB

- Total “round” of tagging: 7 (the 8th round does not tag anything)
- Bad Run Number: (272/2155 tagged)

– 16044110 16044111 16044112 16044114 16044115 16044120 16044123 16044133 16044138 16044139 16045001
16045032 16045033 16045043 16045044 16045045 16045047 16045048 16045049 16045052 16045054 16045055
16045056 16045067 16045068 16045070 16045082 16045083 16045084 16045085 16045086 16045087 16045088
16045089 16045090 16045093 16045094 16045095 16045096 16045097 16045098 16045099 16046076 16046077
16046078 16047004 16047005 16047008 16047101 16047102 16047103 16047104 16047106 16049010 16049012
16049013 16049017 16049018 16049020 16049022 16049023 16049024 16049025 16050036 16050048 16050049
16050050 16050051 16051026 16051034 16051104 16051108 16052013 16052023 16052036 16052039 16052043
16052046 16052048 16052051 16052087 16052088 16053001 16054018 16054073 16054074 16055022 16055025
16055124 16055127 16058070 16058071 16058072 16058073 16058083 16060017 16060018 16060025 16060028
16060036 16060053 16060054 16060055 16060056 16060057 16060058 16060059 16060060 16060061 16060062
16060063 16060064 16060065 16061035 16061076 16062001 16062004 16062005 16062008 16062009 16062011
16062014 16063096 16063097 16063099 16065011 16065036 16065043 16065059 16066028 16068043 16068055
16069037 16069045 16069060 16071001 16071002 16071003 16071006 16071007 16071043 16071044 16071060
16071062 16071076 16072046 16072047 16072057 16073004 16073007 16073015 16078001 16078002 16078003
16078004 16078005 16078006 16078007 16078008 16078009 16078010 16078011 16078012 16078013 16078014
16079026 16079037 16079045 16079051 16079057 16080012 16080043 16082011 16082014 16082045 16083003
16083041 16083044 16084003 16084005 16084016 16084017 16084018 16085005 16085007 16086029 16087018
16088013 16088014 16088015 16088024 16088039 16089002 16089014 16089021 16089023 16091050 16091057
16091058 16092040 16093061 16094018 16095031 16095034 16096030 16096062 16097028 16097029 16097041
16098007 16099033 16100023 16100024 16100051 16100069 16101002 16101003 16101004 16101005 16101007
16101008 16101009 16101010 16101011 16101012 16101013 16101014 16101015 16101016 16101018 16101057
16102053 16102059 16102060 16103051 16104002 16104022 16104026 16104046 16104048 16105044 16106001
16106024 16106031 16106033 16107004 16107005 16107008 16107017 16107042 16108016 16108026 16108030
16108045 16109006 16110005 16113002 16113009 16114032 16114034 16114036 16115031 16115056 16116015
16116018 16116020 16116021 16116048 16116049 16117008 16117009 16117015