Muon bacground in PNN2 data analyses.

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October 5, 2006

The PNN2_SKIM set of 2002 data taking run has been used in this analysis. The total statistics in this set is 680191 events. Cuts for muon background in PNN2 1996 data were taken of Bipul Bhuyan's thesis without detail consideration as first approximation.

Cut name	Number of events for trigger type after cut			
	PNN 1 or 2	PNN 1	PNN 2	PNN 1 and 2
PNN2_SKIM	30994941	20951428	10043513	5535543
COUNTER	30994940(1)	20951428(1)	10043513(1)	5535543(1)
BAD_RUN	30409574(1.019)	20595150(1.017)	9814425(1.023)	5418959(1.021)
FIX_ALL	30409574(1)	20595150(1)	9814425(1)	5418959(1)

Table 1: The general run rejection branch cuts and number of events rejected every cut

Cut name	Number of events for trigger type after cut			
	PNN 1 or 2	PNN 1	PNN 2	PNN 1 and 2
B4DEDX	24725684(1.229)	16880068(1.22)	7845619(1.25)	4543357(1.192)
BWTRS	15095708(1.637)	10647384(1.585)	4448327(1.763)	2930638(1.55)
B4TRS	13026742(1.158)	9272770(1.148)	3753975(1.184)	2524801(1.16)
B4CCD	12888376(1.01)	9173575(1.01)	3714804(1.01)	2496884(1.011)
CKTRS	8631407(1.493)	6311592(1.453)	2319818(1.601)	1684680(1.482)
CPITRS	7919398(1.089)	5806388(1.087)	2113013(1.097)	1600777(1.052)
TIMCON	6405432(1.236)	4857531(1.195)	1547904(1.365)	1313690(1.218)
PCUTS	6405432(4.74747)	4857531(4.23984)	1547904(6.34046)	1313690(4.12499)

Table 2: The PCUTS rejection branch cuts and number of events rejected every cut

Cut name	Number of events for trigger type after cut			
	PNN 1 or 2	PNN 1	PNN 2	PNN 1 and 2
B4TIM	5511665(1.162)	4248408(1.143)	1263260(1.225)	1104750(1.189)
B4EKZ	4352644(1.266)	3454124(1.229)	898523(1.405)	884551(1.248)
B4EKZ_IC	4352644(1)	3454124(1)	898523(1)	884551(1)
TGZFOOL	4352644(1)	3454124(1)	898523(1)	884551(1)
EPITG	4289523(1.014)	3424510(1.008)	865016(1.038)	873091(1.013)
EPIMAXK	4131765(1.038)	3309965(1.034)	821803(1.052)	841491(1.037)
TGER	4090406(1.01)	3276584(1.01)	813825(1.009)	834517(1.008)
TARGF	3862652(1.058)	3109518(1.053)	753137(1.08)	792692(1.052)
DTGTTP	3861411(1)	3108558(1)	752856(1)	792490(1)
RTDIF	3814124(1.012)	3074349(1.011)	739778(1.017)	785022(1.009)
DRP	3791884(1.005)	3059002(1.005)	732885(1.009)	781533(1.004)
TGKTIM	3593858(1.055)	2930069(1.044)	663792(1.104)	741668(1.053)
EIC	3395449(1.058)	2772077(1.056)	623375(1.064)	703513(1.054)
TIC	3393986(1)	2771034(1)	622955(1)	703179(1)
TGEDGE	3311686(1.024)	2710926(1.022)	600763(1.036)	680628(1.033)
TGENR	3069905(1.078)	2527487(1.072)	542421(1.107)	653492(1.041)
PIGAP	3036802(1.01)	2502469(1.01)	534336(1.015)	647777(1.008)
TGLIKE	2881693(1.053)	2389410(1.047)	492286(1.085)	614354(1.054)
TGB4	2725676(1.057)	2267919(1.053)	457760(1.075)	585332(1.049)
PHIVTX	2576751(1.057)	2167701(1.046)	409053(1.119)	551776(1.06)
OPSVETO	2374053(1.085)	2007959(1.079)	366097(1.117)	466590(1.182)
TGPVCUT	2283689(1.039)	1940131(1.034)	343561(1.065)	434225(1.074)
TIMKF	1840534(1.24)	1568129(1.237)	272408(1.261)	339462(1.279)
CCDPUL	683744(2.691)	593075(2.644)	90672(3.004)	121586(2.791)
DELCO6	617331(1.107)	535928(1.106)	81406(1.113)	109731(1.108)
NPITG	‘617331(1)	535928(1)	81406(1)	109731(1)
VERRNG	563245(1.096)	489961(1.093)	73287(1.11)	100723(1.089)
ANGLI	562938(1)	489694(1)	73247(1)	100682(1)
ALLKFIT	521391(1.079)	453860(1.078)	67534(1.084)	92972(1.082)
TPICS	440065(1.184)	383853(1.182)	56215(1.201)	79685(1.166)
KIC	437008(1.006)	381274(1.006)	55737(1.008)	79326(1.004)
EPIONK	436289(1.001)	380679(1.001)	55613(1.002)	79206(1.001)
TGCUTS	436289(14.6816)	380679(12.7602)	55613(27.8335)	79206(16.5857)

Table 3: The TGCUTS rejection branch cuts and number of events rejected every cut

Cut name	Number of events for trigger type after cut			
	PNN 1 or 2	PNN 1	PNN 2	PNN 1 and 2
-RNGMOM	199120(2.191)	183085(2.079)	16038(3.467)	15820(5.006)
COS3D	180926(1.1)	165964(1.103)	14965(1.071)	12490(1.266)
ZFRF	157734(1.147)	142774(1.162)	14963(1)	10760(1.16)
ZUTOUT	157601(1)	142700(1)	14904(1.003)	10760(1)
RSDEDX	69024(2.283)	60127(2.373)	8900(1.674)	5725(1.879)
UTCQUAL	60441(1.142)	53249(1.129)	7195(1.236)	4785(1.196)
PRRF	32912(1.836)	26463(2.012)	6452(1.115)	3819(1.252)
BOXCUT	5370(6.128)	454(58.288)	4919(1.311)	421(9.071)
SETUP	5370(81.2449)	454(838.489)	4919(11.306)	421(188.135)
BOX2	5170(6.365)	440(60.143)	4733(1.363)	407(9.383)
SETUP	5170(84.3886)	440(865.18)	4733(11.7501)	407(194.609)

Table 4: The SETUP rejection branch cuts and number of events rejected every cut

Cut name	Number of events for trigger type after cut			
	PNN 1 or 2	PNN 1	PNN 2	PNN 1 and 2
LAYV4	5170(1)	440(1)	4733(1)	407(1)
IPIFLG	3061(1.688)	254(1.732)	2810(1.684)	233(1.746)
ISTEV5M1	1810(1.691)	136(1.867)	1677(1.675)	124(1.879)
ELVETO	916(1.975)	75(1.813)	844(1.986)	70(1.771)
TDFOOL	906(1.011)	73(1.027)	836(1.009)	69(1.014)
TDVARNN	18(50.333)	2(36.5)	19(44)	1(69)
ALL_CUTS	18(1.72194E+06)	2(10475714)	19(528606)	1(5535543)

Table 5: The TDCUT1 rejection branch cuts and number of events rejected every cut if PNN1 or PNN2 BOX cut.

In Tables 2,3,4,5 are listed the cut names in rejection branch, used by B.Bhuyan for the 1996 data set, and number of events rejected by every cut.
It turned out that the meaning of "composite" cuts and sometimes the name of "basic" cuts have been changed from 1996 and what is more the cut constants has to be adjusted properly.

General remarks.

Make detail consideration of cuts from Bipul Bhuyan's thesis. To apply "basic" or "simple" cut function instead of "composite" or "compound" one

1 PCUTS comprises 7 cuts
B4DEDX BWTRS B4TRS B4CCD CKTRS CPITRS TIMCON

2 TGCUTS comprises 32 cuts
B4TIM B4EKZ B4EKZ_IC TGZFOOL EPITG EPIMAXK TGER TARGF DTGTTP RTDIF DRP TGKTIM EIC TIC TGEDGE TGENR PIGAP TGLIKE TGB4 PHIVTX OPSVETO TGPVCUT TIMKF CCDPUL DELCO6 NPITG VERRNG ANGLI ALLKFIT TPICS KIC EPIONK

3 -RNGMOM
4 COS3D
5 ZFRF
6 ZUTOUT
7 RSDEDX
8 UTCQUAL
9 PRRF
10 LAY14
11 TDCUT1 comprises 5 cuts
RSHEX ELVETO PROBTD TDFOOL TDDFA1

Changes in cuts of Bipul Bhuyan's thesis :

1). B4TD of PCUTS set changed to B4CCD
2). BHTRS of PCUTS doesn't exist more.
3). TIMCON-TPI and TIMCON-TK of PCUTS set substituted by TIMCON.
4). EPIMAX of TGCUTS set changed to EPIMAK
5). PBG of TGCUTS set doesn't exist more.
6). PROBTD of TDCUT1 set doesn't exist more and could be substituted by ntuple variable with the same name and is still used in
/home/e949/pass2/02/anal/func/tdcut1.function
if(probtd.lt.0.01) tdcut1 =0.
6). TAIL_F of TDCUT1 set doesn't exist more from 1998 March and was replaced by TDDFA1 and TDDFA2 (different value of dfa1min - 4.2 and 2.6).

To find out the rejection cut branch used in PNN1 analyses for suppression of muon background and use as control one.

Plans.

We have to use TDCUT02 cut instead old one TDCUT1 comprise:

IPIFLG

ISTEV5M1

ELVETO - exist in TDCUT1

TDFOOL - exist in TDCUT1

TDVARNN

and have to apply BOX cuts

for PNN1: BOXCUT and LAYV4_PNN1

for PNN2: BOX2 and LAYV4

Let's crunch the numbers !