

Event Mixup

2024/02/21

INTTJP

NWU Mai Kano

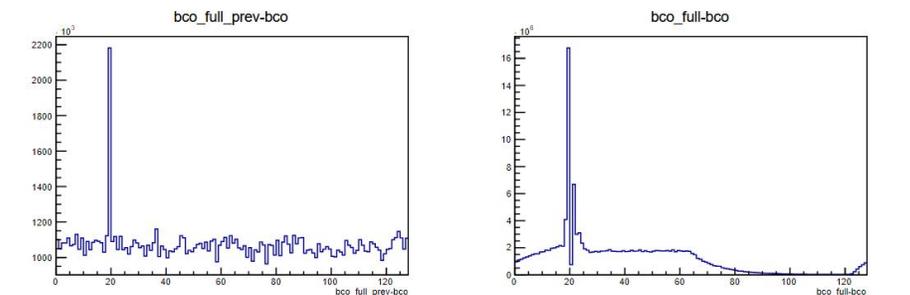
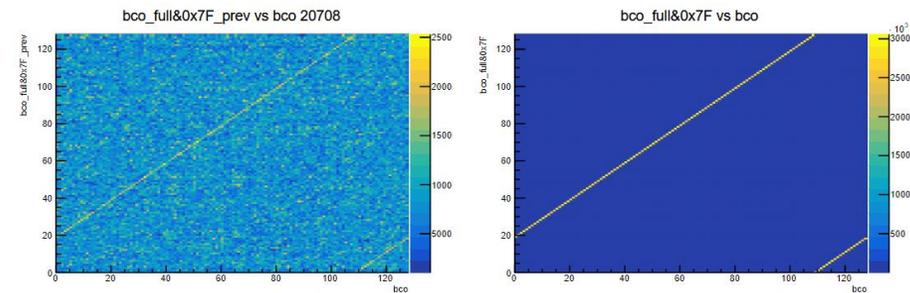
やったこと

- Felix upgrade(7/21)以降のデータをいくつか選び、Mixupについて調べた。
- Zero-fieldのデータでも同様に調べた。

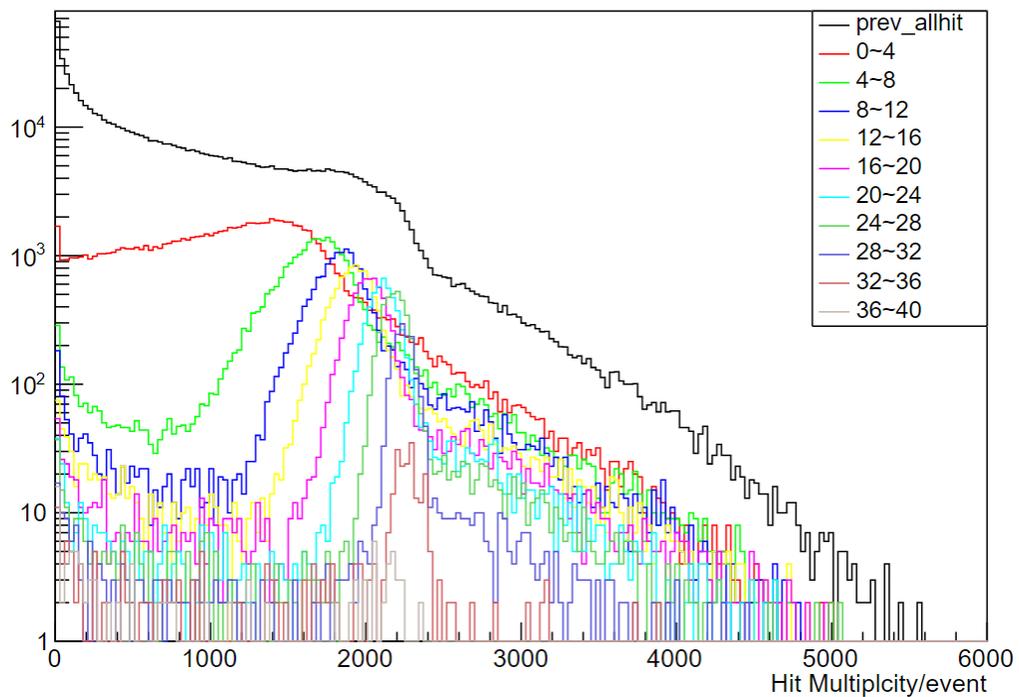
Run20708(upgrade前)

今までの解析で確認できたこと

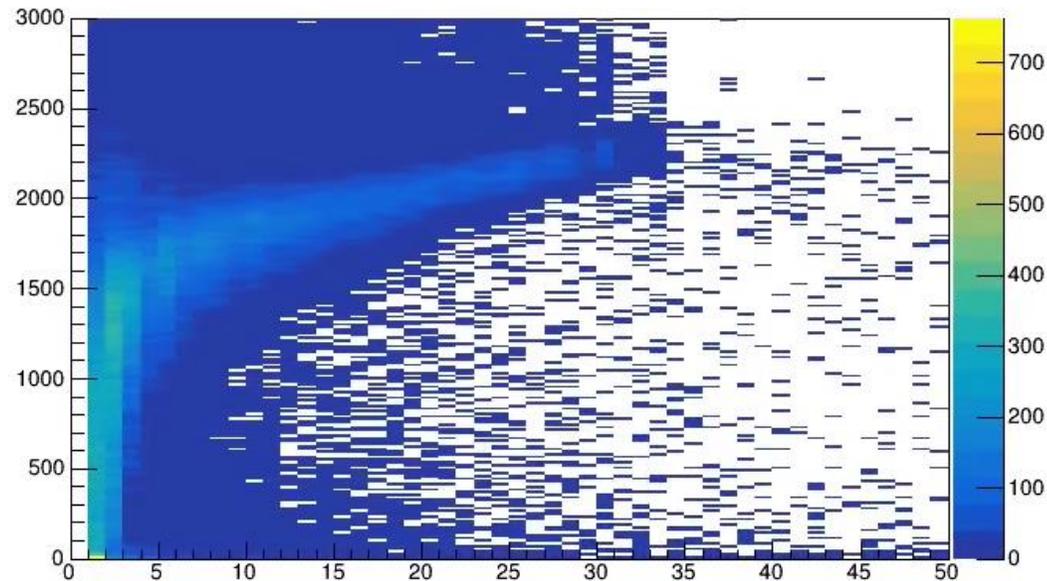
- BCO_Full_preとBCOの相関やピーク
- 前のイベントのMultiplicity とMixupヒットの数の相関



Mixup Multiplicity 20708



Nmixup vs prev_allhit



Zero-field(upgrade前)

INTT zero-field runs

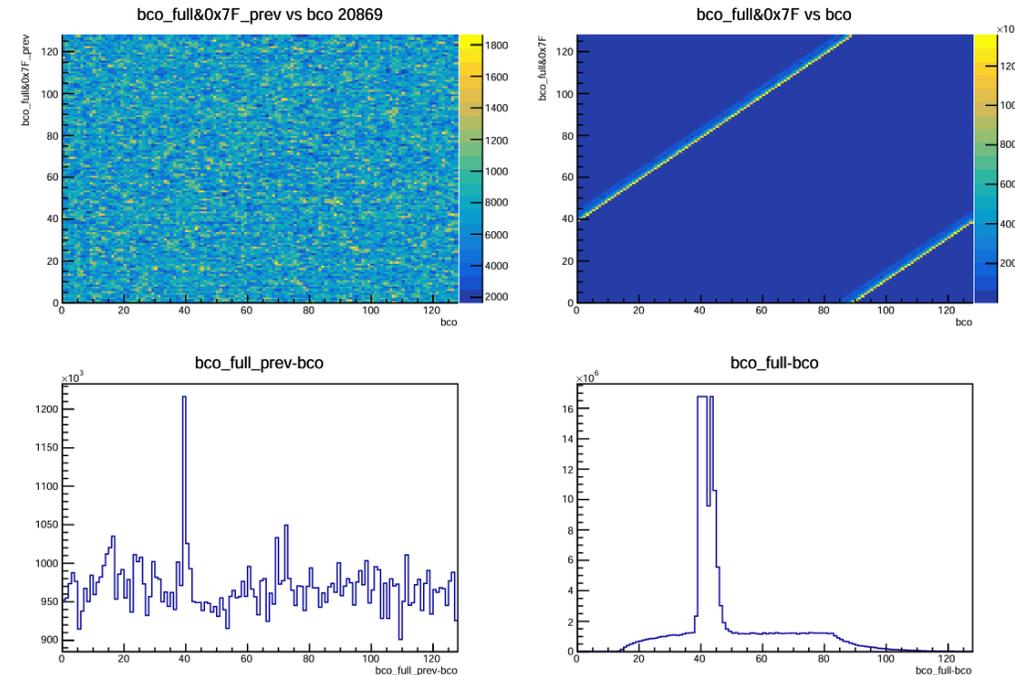
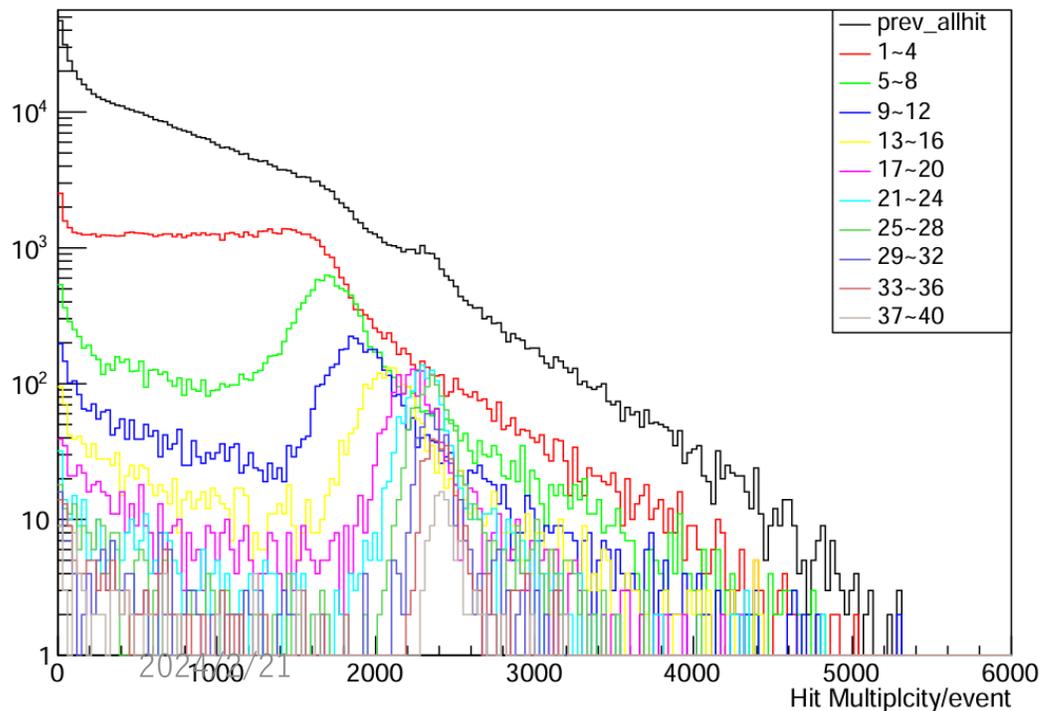


RunNumber (ZF)	Nevents
20864	417,729
20866	26,404
20867	317,047
20868	288,481
20869	550,123
20878	89,238
20880	171,760
20881	31,736
20883	94,249
20885	357,343
Sum	2,344,110

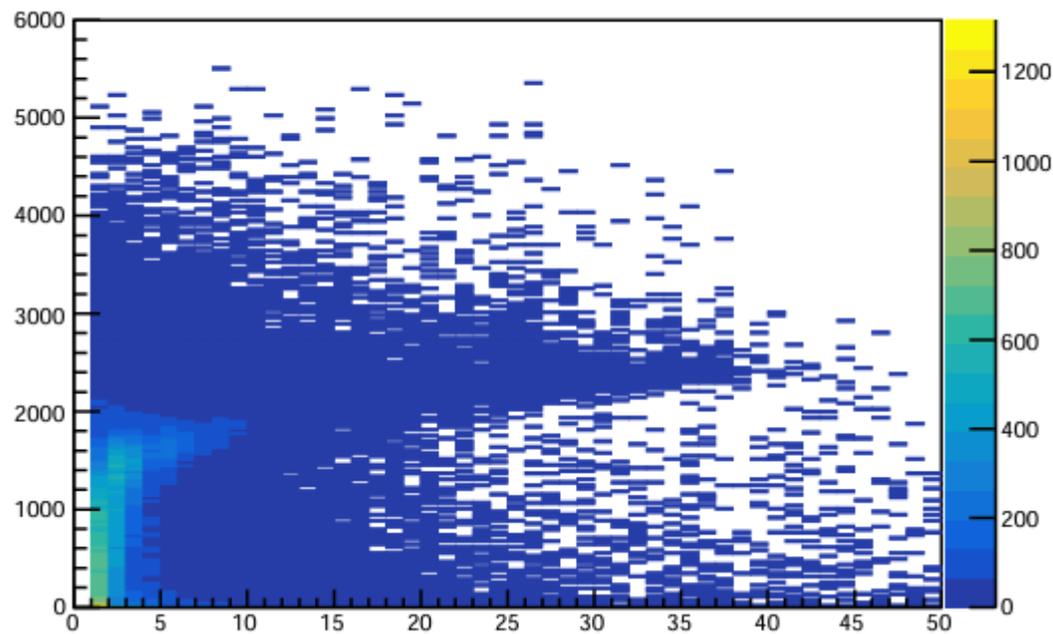
Zero-field(upgrade前)

- 今までの解析と同様にMixupがあることを確認

Mixup Multiplicity 20869



prev_allhit vs Nmixup



Felix upgrade後で確認したRun

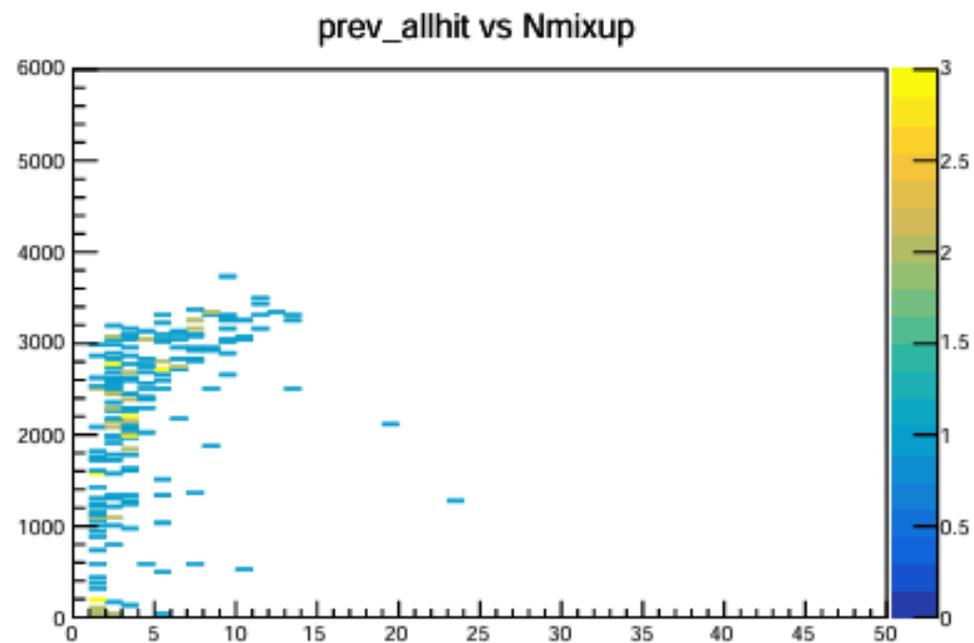
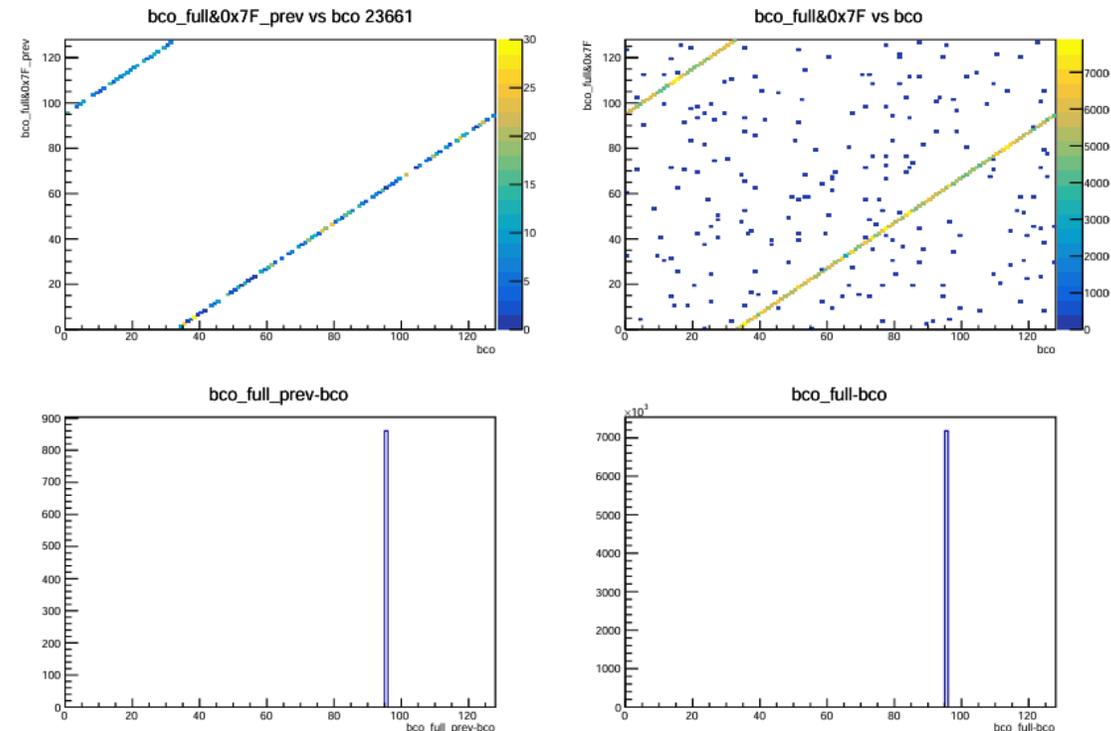
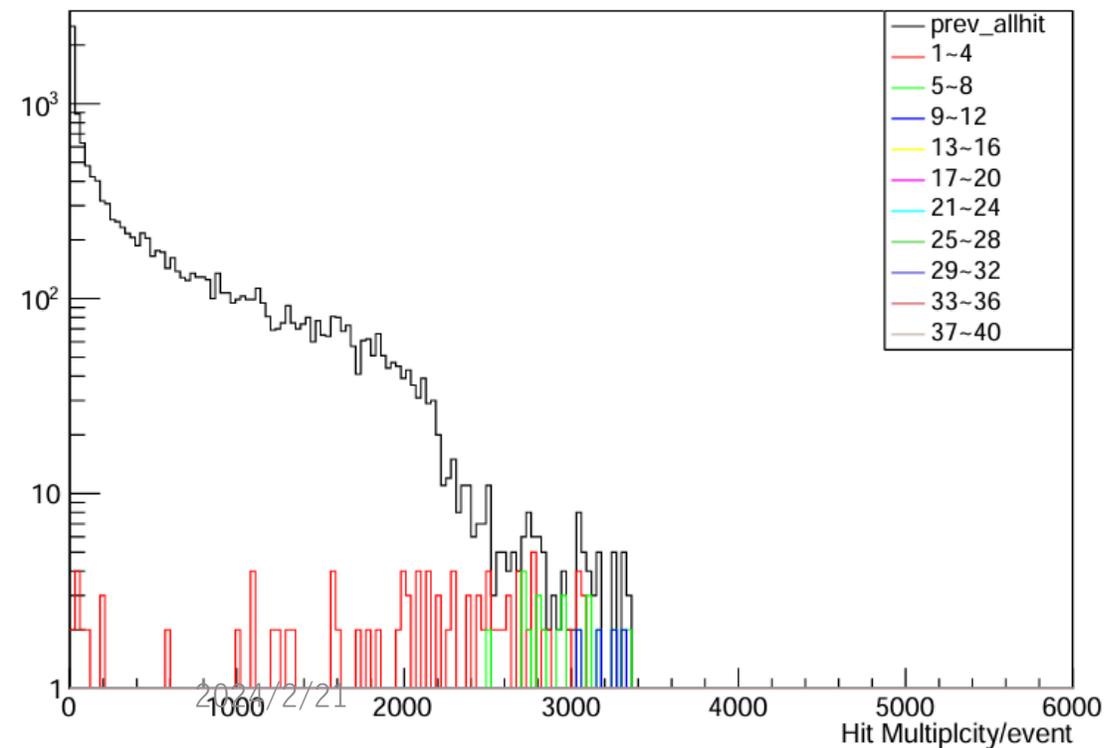
出来る限り測定時間が長く、Scanを行っていないRun

- 22926 n_collision=127 Modebit=79
- 22949
- 22950
- 22951
- 22979
- 22986
- 22987
- 23661 n_collision=0 Modebit=91
- 23896 n_collision=4 Modebit=92

Upgrade後の結果①

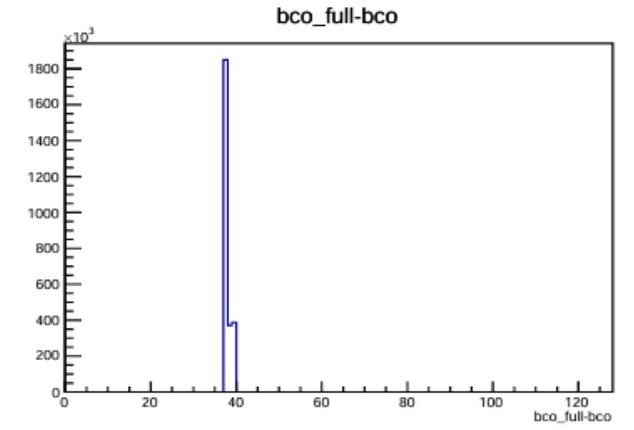
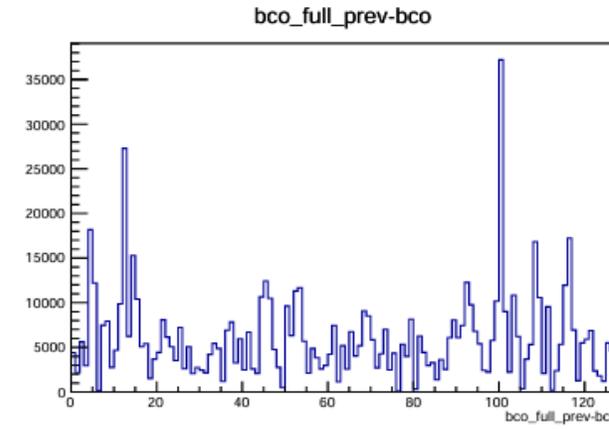
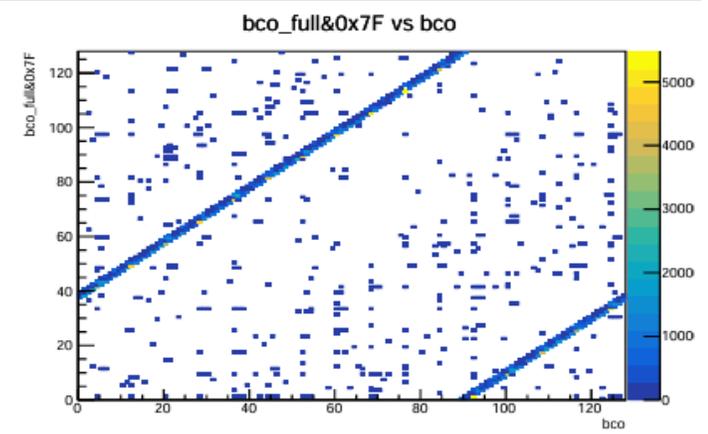
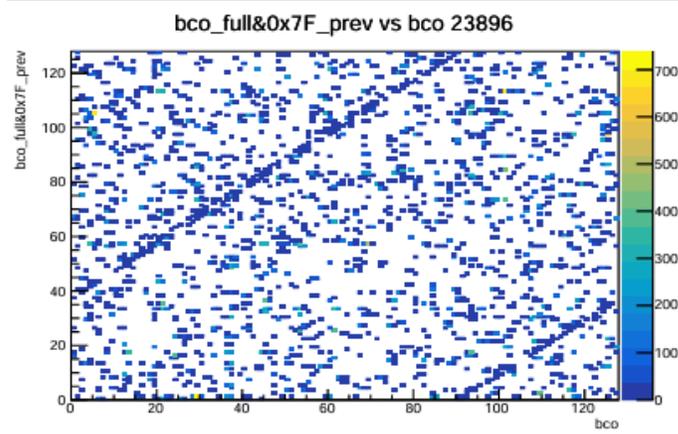
- 測定時間が短くイベント数が少ないがMixupが起きているような結果が得られた
- しかしMultiplicity 分布は異なる結果になった。

Mixup Multiplicity 23661

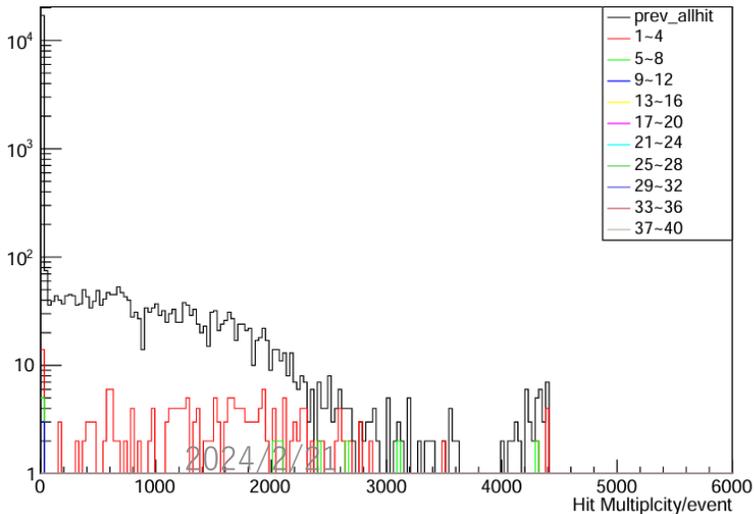


Upgrade後の結果②

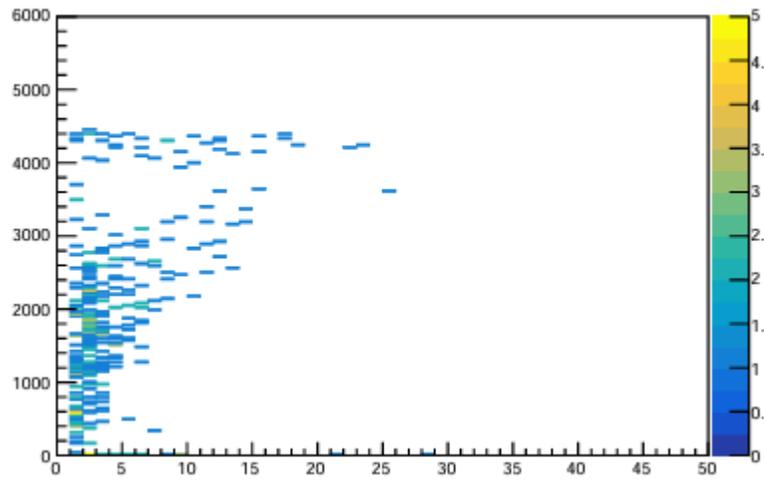
- 測定時間が短くイベント数が少ないが Mixupが起きているような結果が得られた
- しかしBCO_Full_pre-BCOのピークが BCO_Full-BCOとは異なる位置に出た



Mixup Multiplicity 23896



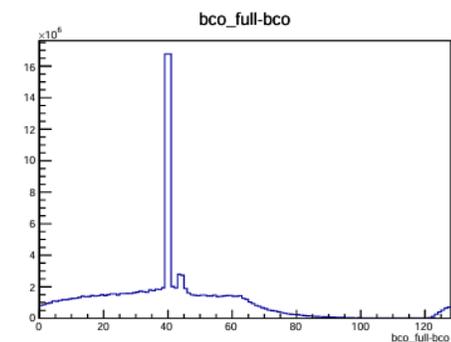
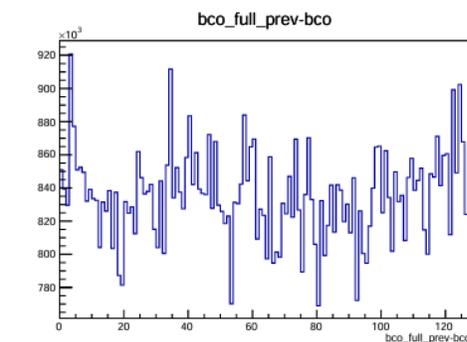
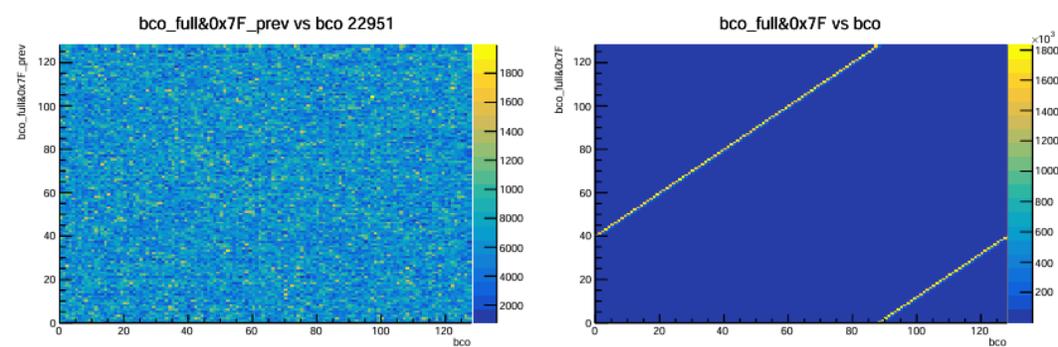
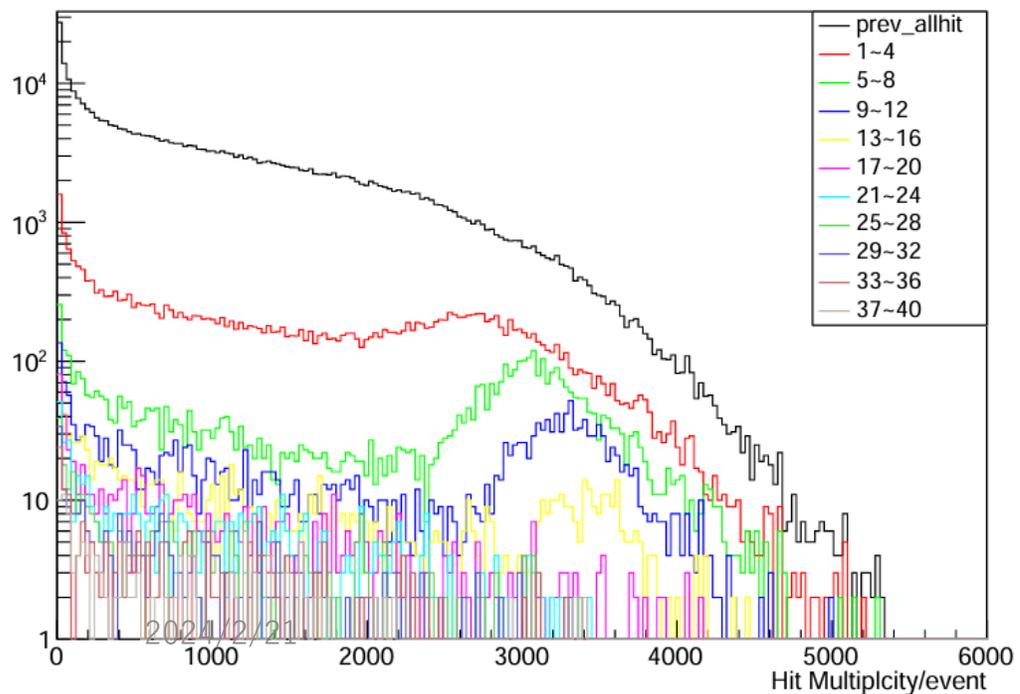
prev_allhit vs Nmixup



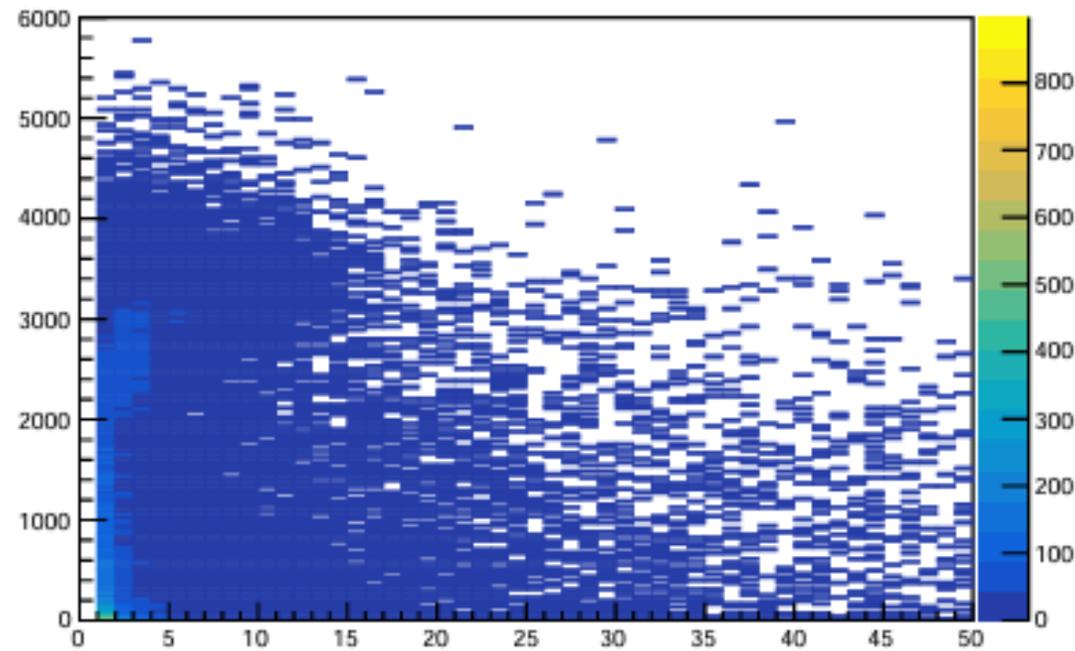
Upgrade後の結果③

- BCO_full_preとBCOのプロットのみを見るとMixupは無いように見える
- Multiplicity分布が異なる形になった（ピーク的位置が変わった）
- しかしNmixupvsMultiplicityは相関があるようにも見える
Mixupが起きているかどうか？

Mixup Multiplicity 22951



prev_allhit vs Nmixup



まとめ・今後やること

- ファームウェアアップグレード前後でプロットに変化があった。
- アップグレード後でもEvent Mixupの現象は起こっている。
- Mixupでないとき(選ぶBCOピークをずらす)どのようなプロットになるか調べ、今回確認できたプロットがMixupによるものなのかそうでないかを判断できるようにする。
- 宇宙線のデータでも調べる。
- ラダーごとに調べる。ラダー0だけのピークの形が他のデータでも確認されるかどうか。その後チップごとに調べる。
- 前のイベントからのクローンヒットとMixupの関係を調べる。
- Hot channelとMixupの関係を調べる。

Run#	Time/Date	DAC0	L1 Delay	open_time	n_collisions	Modebit	
22926	7/21	15	21	35	127	79	separete INTT sever .but south side has 1peak
22949	7/21	15	21	35	127	79	Found intt servers to have different event numbe
22950		15	21	35	127		
22951		15	21	35	127		
22979	7/21	15	21	35	127		Stability check
22985		15	21	35	127		Stability check
22986		15	21	35	127		Stability check
22987		15	21	35	127		Stability check
23661		15	21	35	0	91	
23896	7/26	15	21	35	4	92	

RunNumber FelixNumber (upgrade後)

左図

上段 : BCO vs BCO_full_pre , BCO vs BCO_full

下段 : BCO_full_pre - BCO, BCO_full - BCO

右図

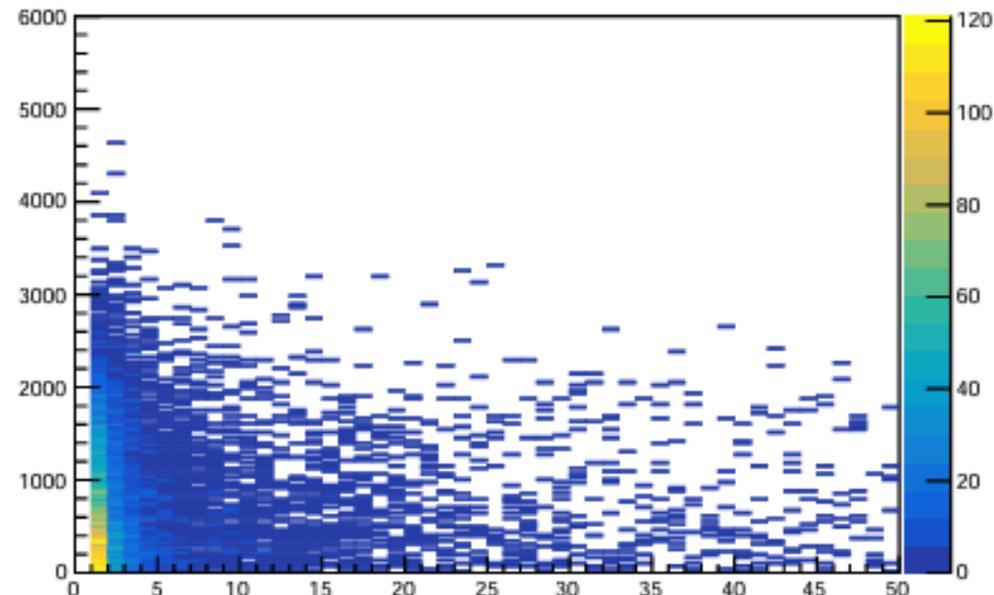
上段 : Number of Mixup hit vs Number of previous multiplicity

下段 : Previous event multiplicity separated by Number of Mixup

Intt0~2においてRun22949~22951はデータ ×

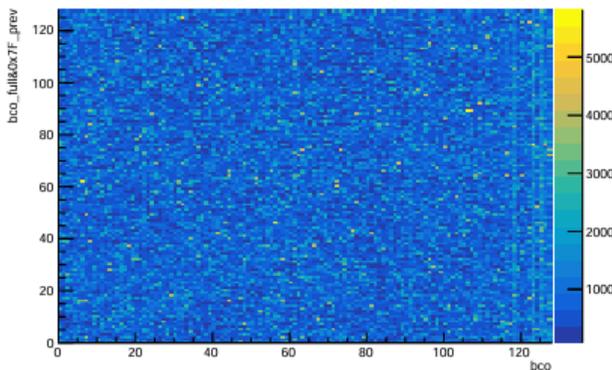
Run22926 intt0

prev_allhit vs Nmixup

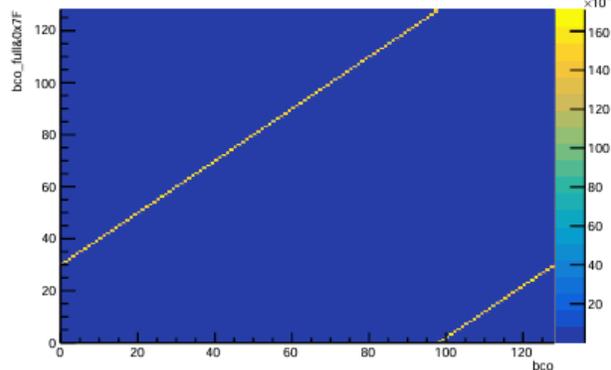


Mixup Multiplicity 22926

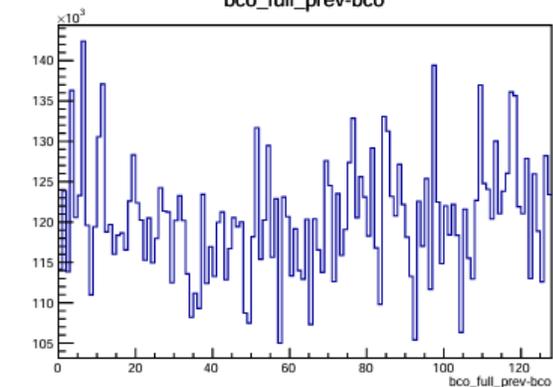
bco_full&0x7F_prev vs bco 22926



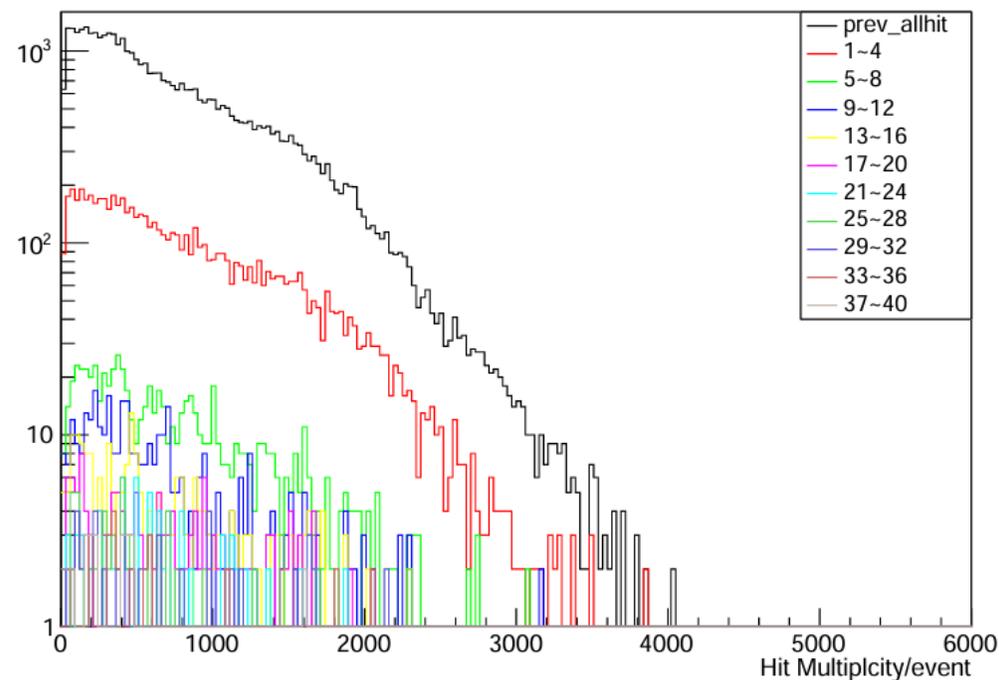
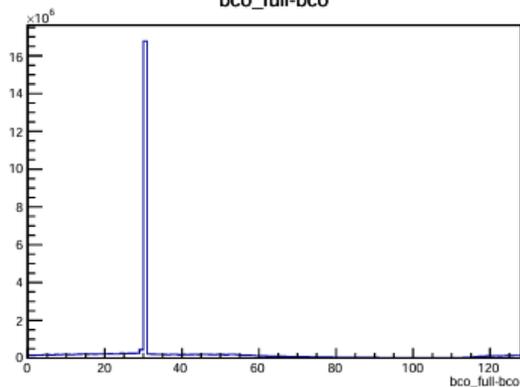
bco_full&0x7F vs bco



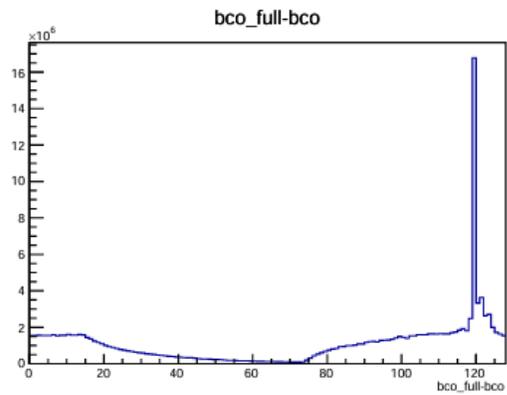
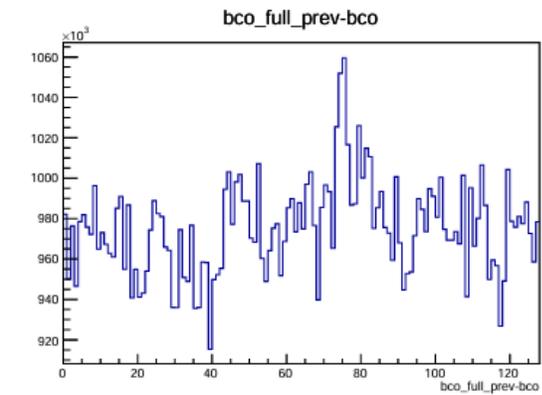
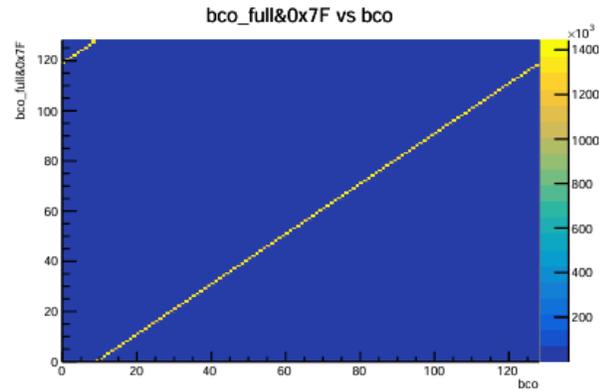
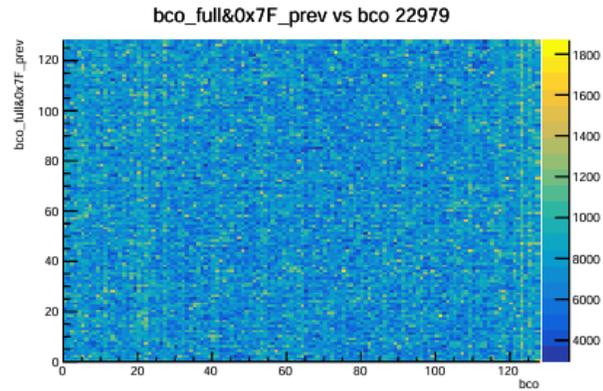
bco_full_prev-bco



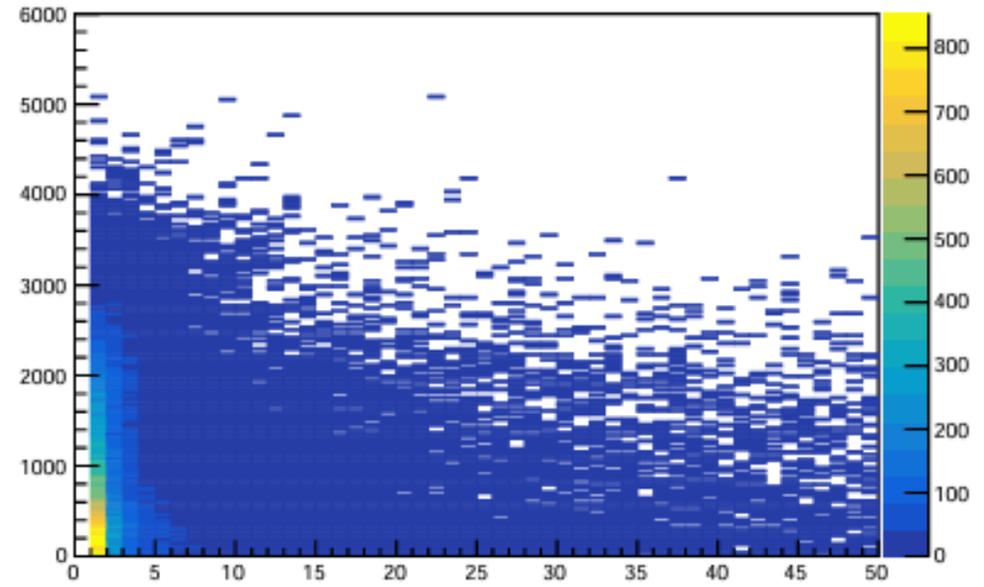
bco_full-bco



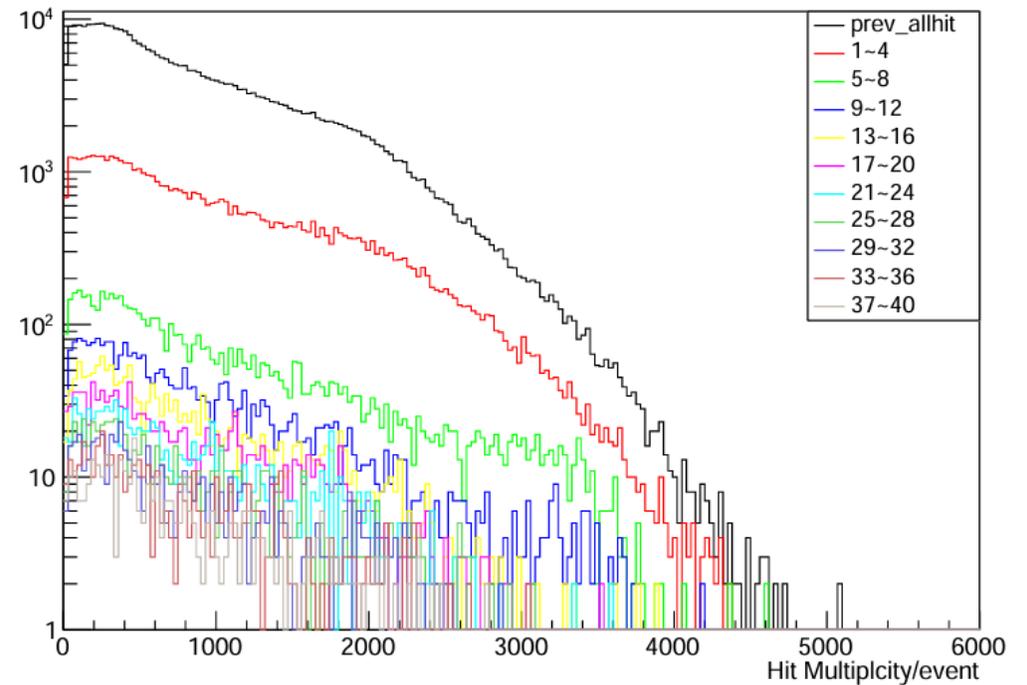
Run22979 inttt0



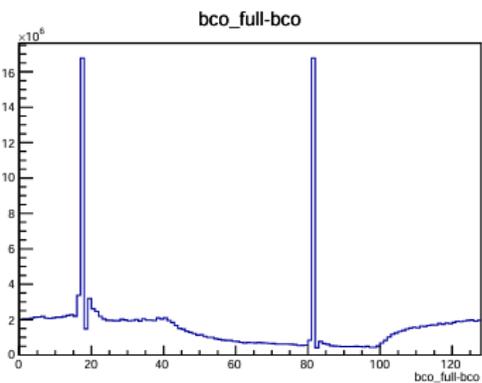
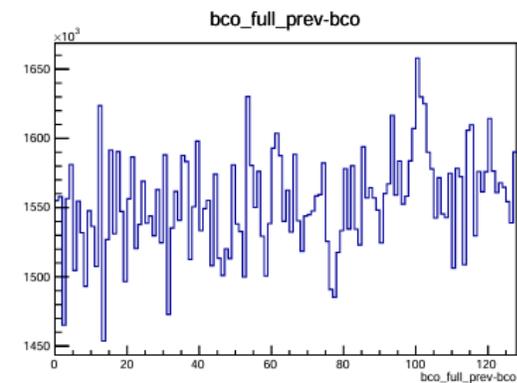
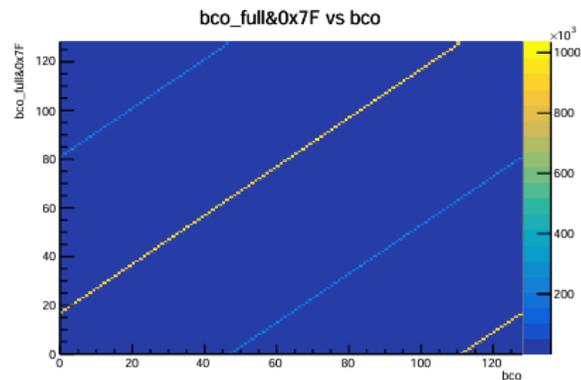
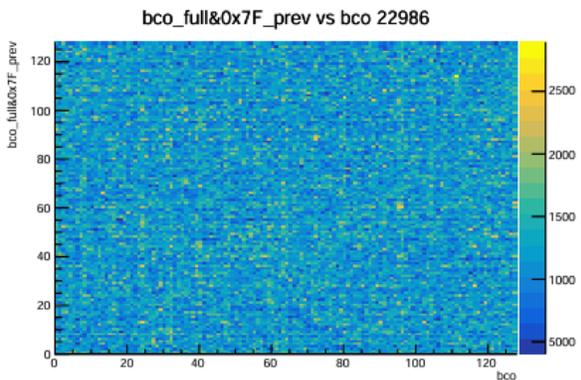
prev_allhit vs Nmixup



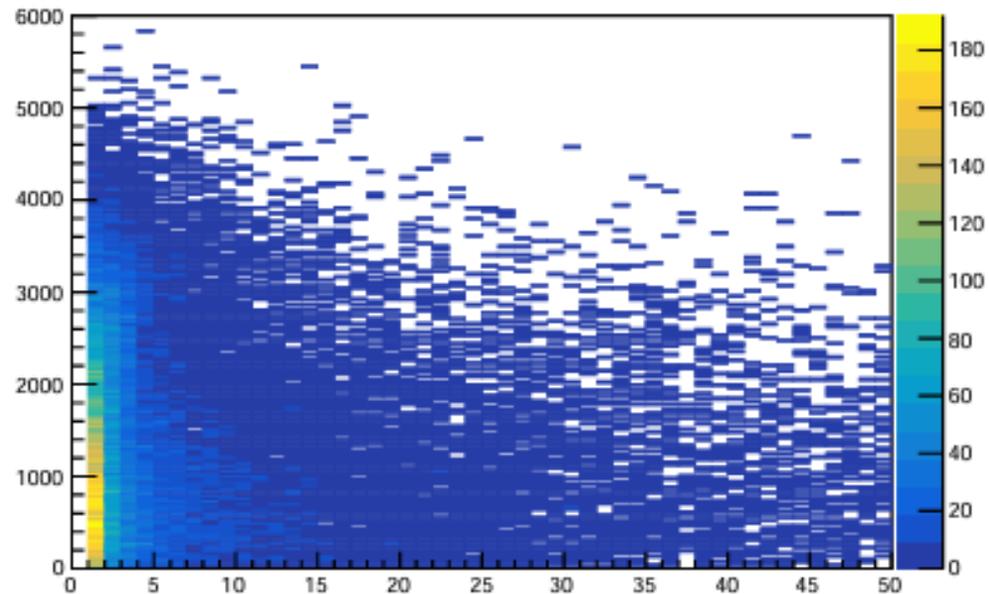
Mixup Multiplicity 22979



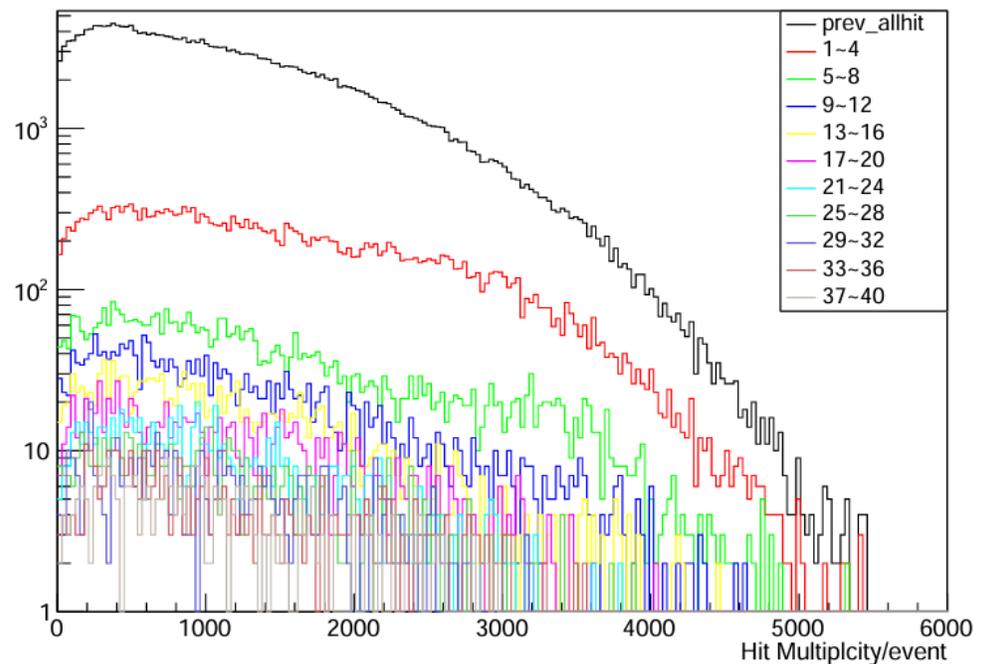
Run22986 intt0



prev_allhit vs Nmixup

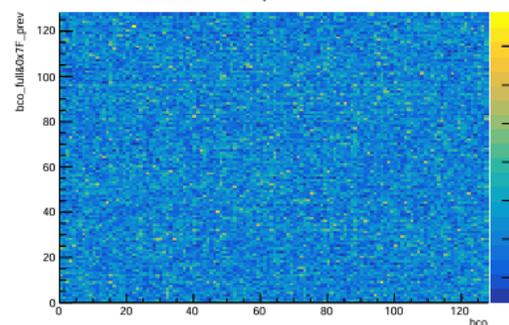


Mixup Multiplicity 22986

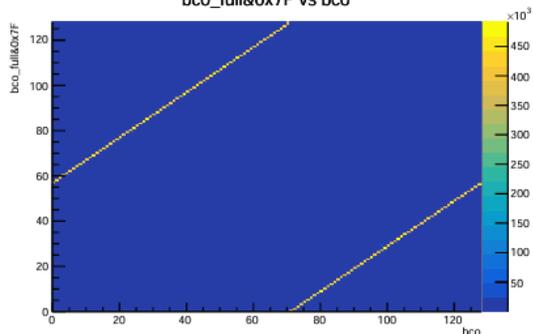


Run22987 inttt0

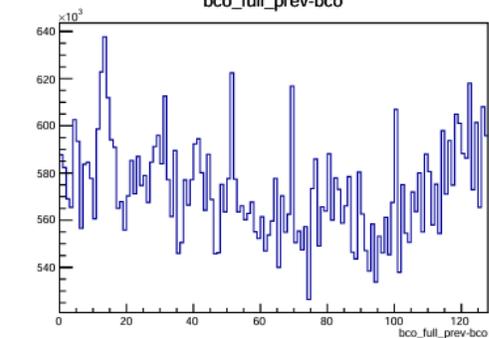
bco_full&0x7F_prev vs bco 22987



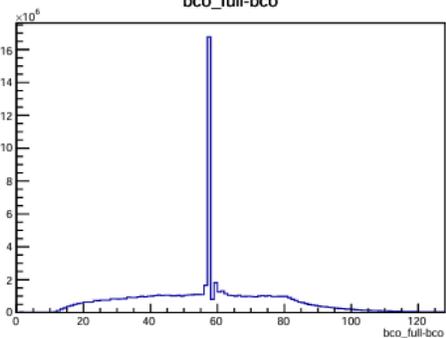
bco_full&0x7F vs bco



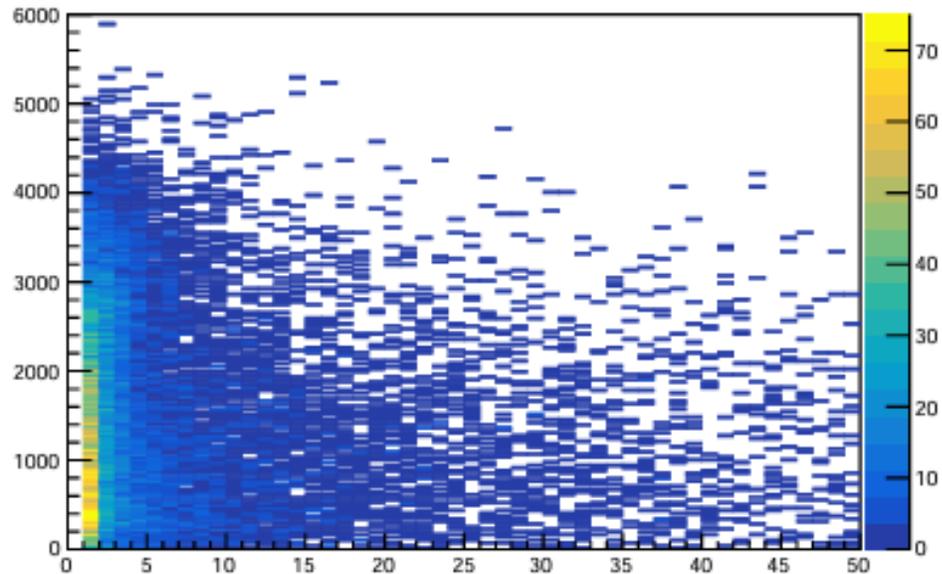
bco_full_prev-bco



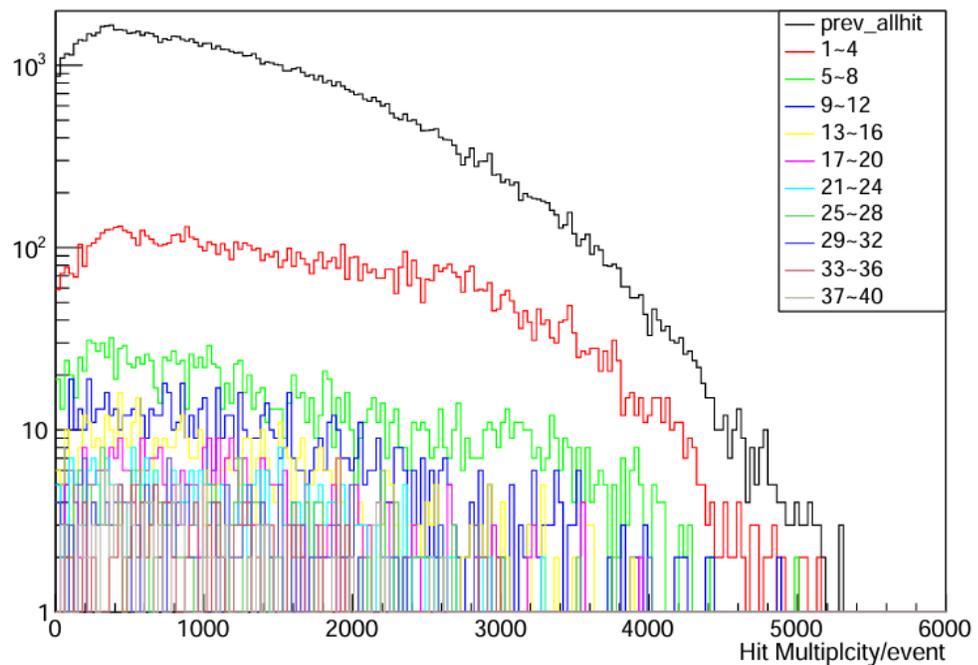
bco_full-bco



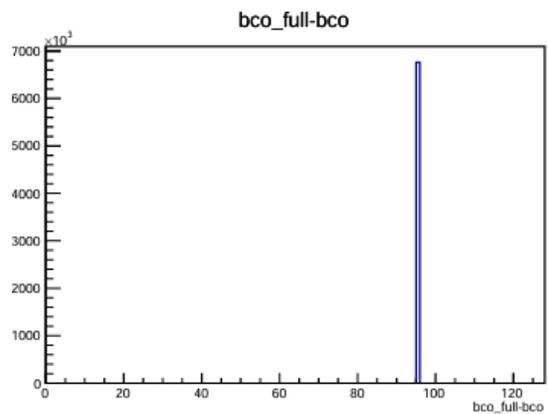
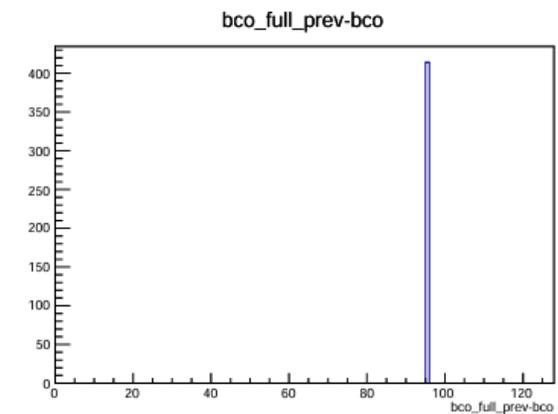
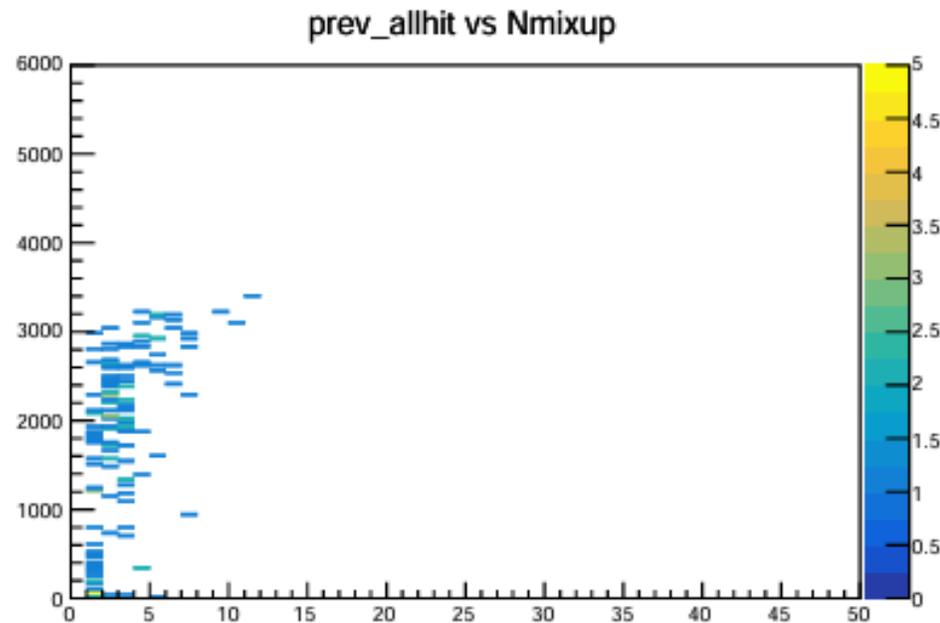
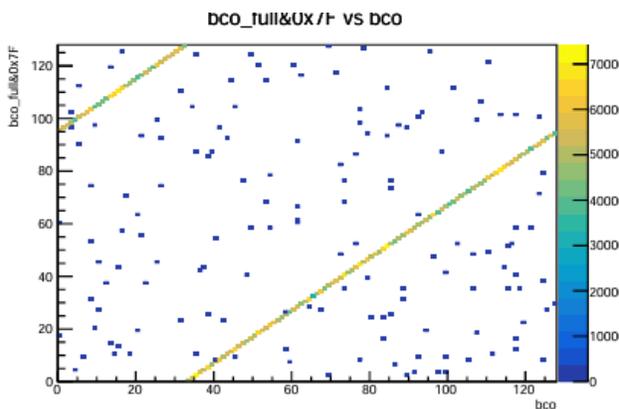
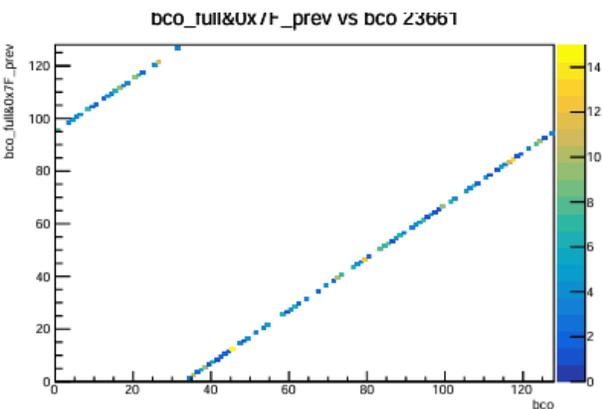
prev_allhit vs Nmixup



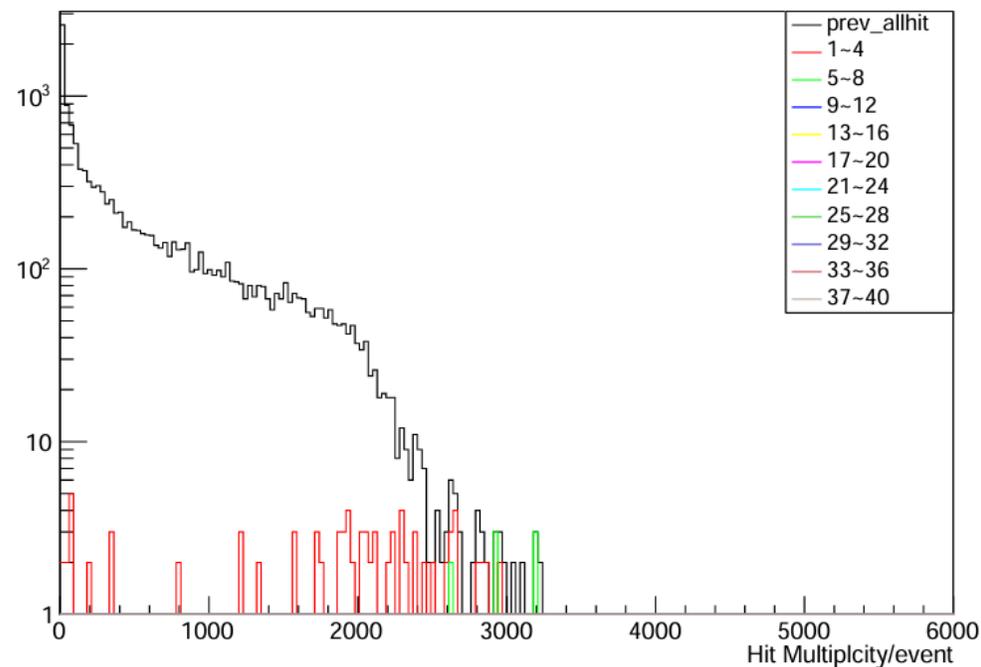
Mixup Multiplicity 22987



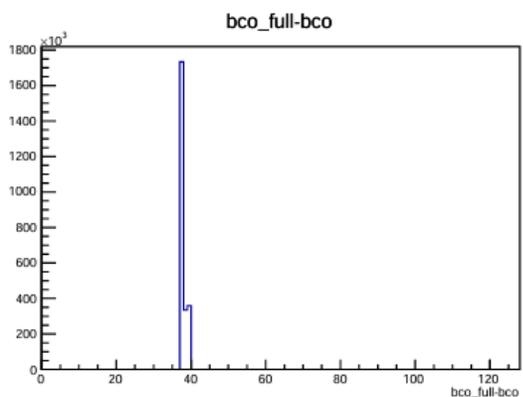
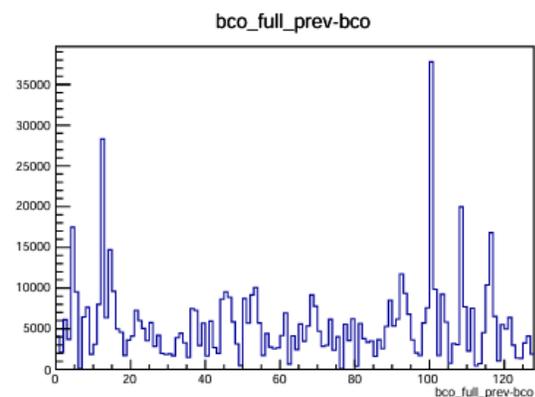
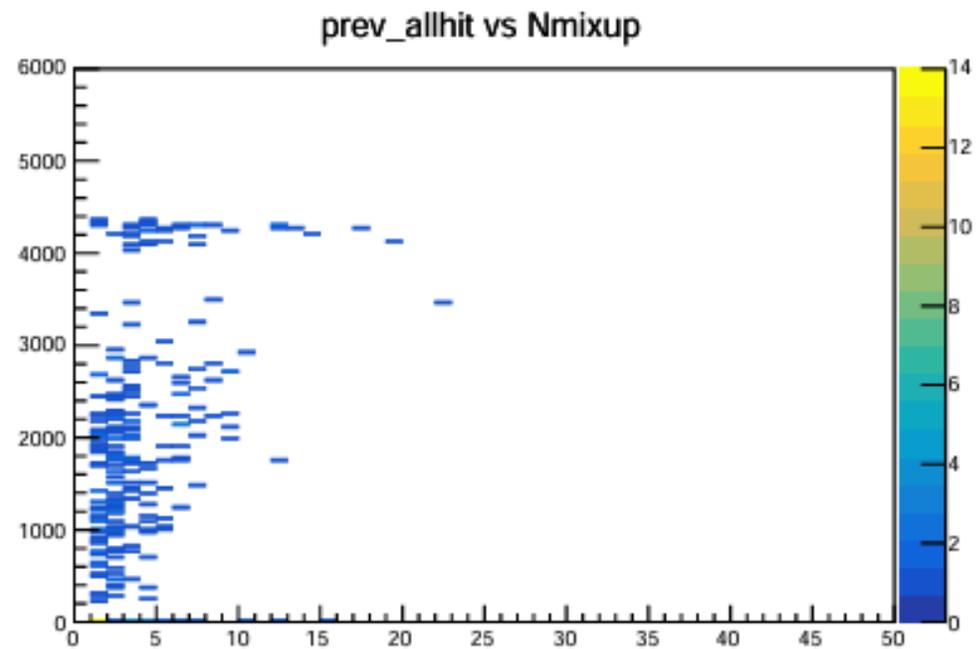
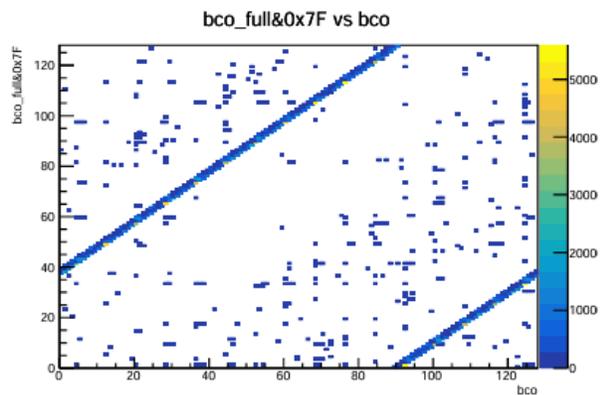
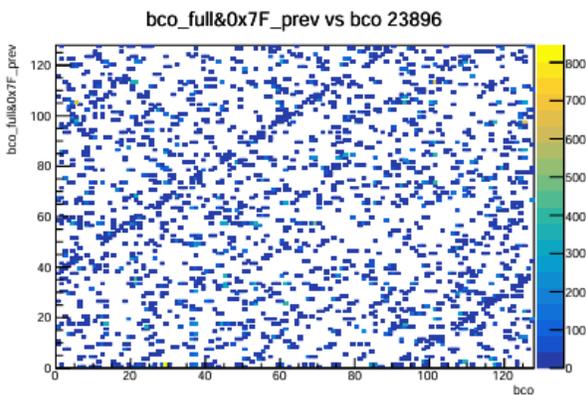
Run23661 inttt0



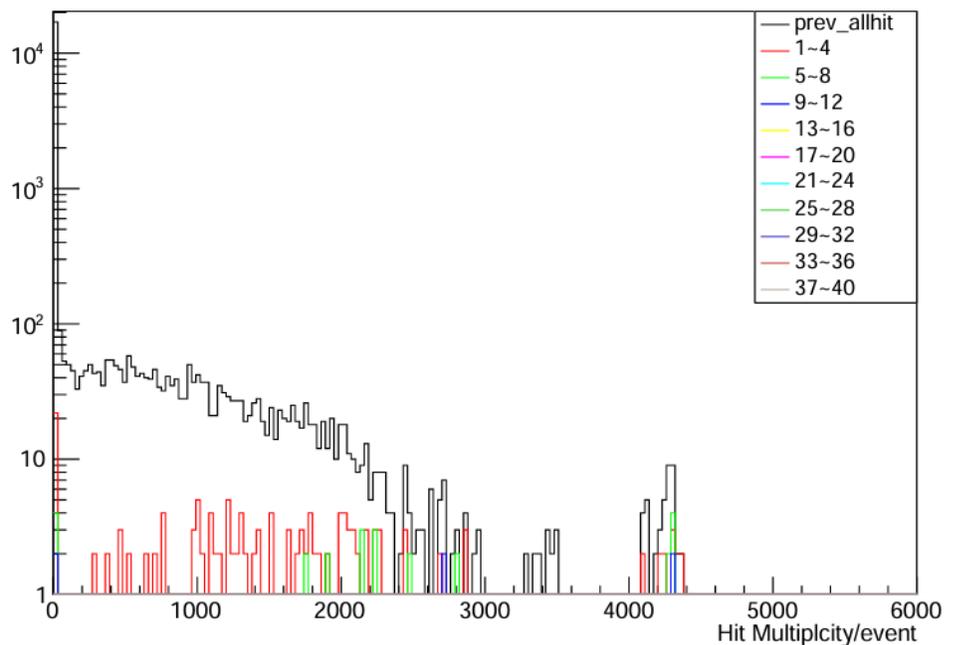
Mixup Multiplicity 23661



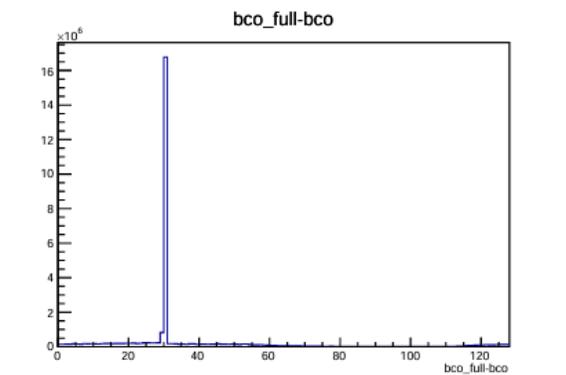
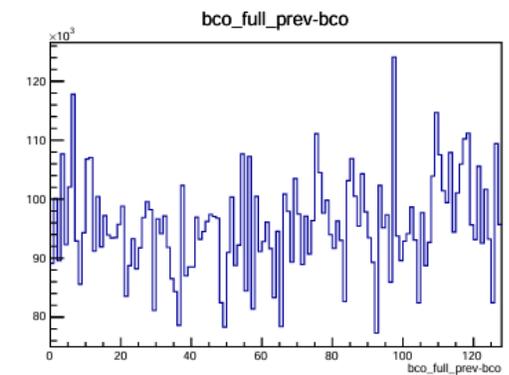
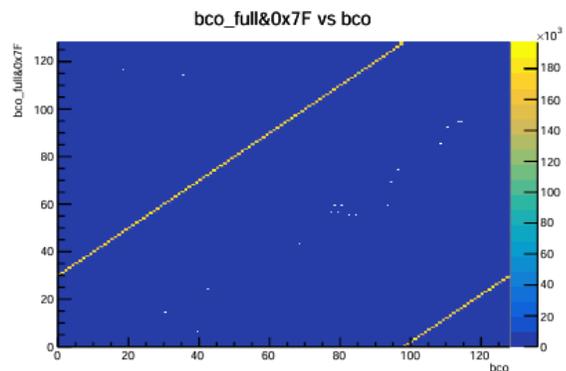
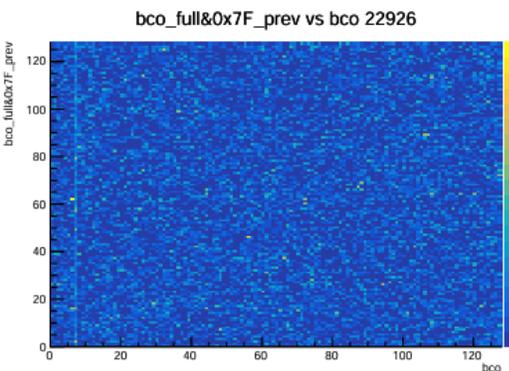
Run23896 intt0



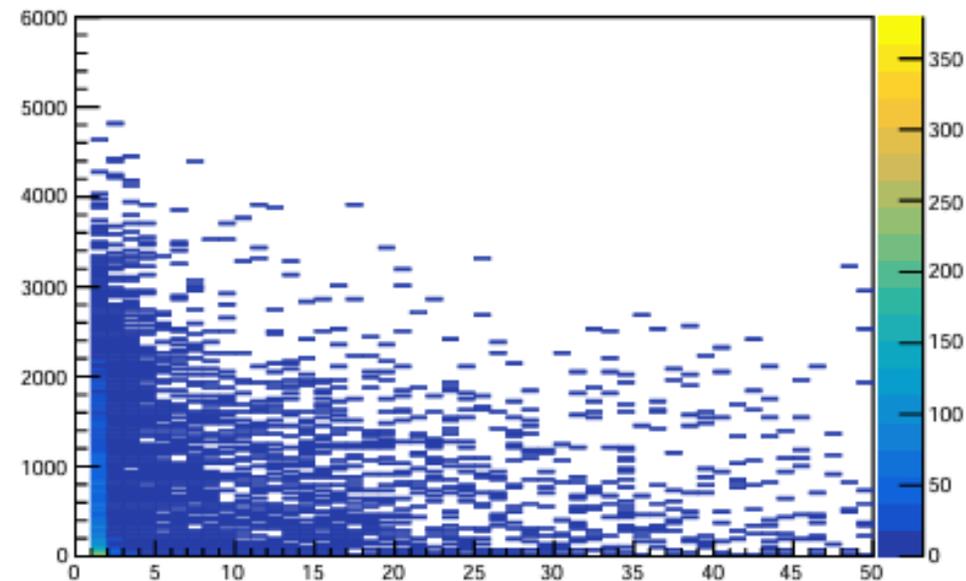
Mixup Multiplicity 23896



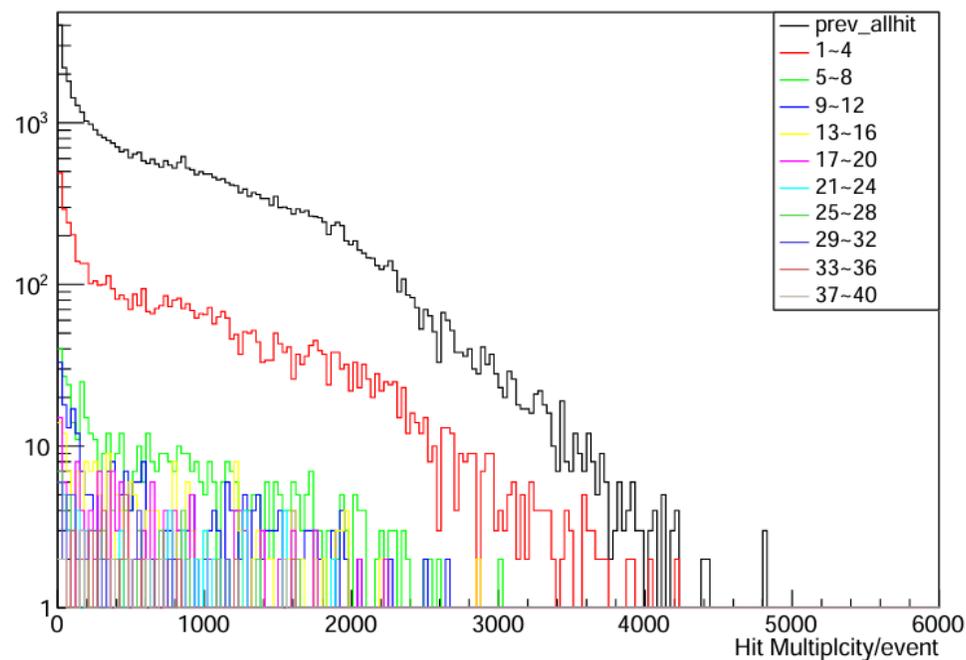
Run22926 intt1



prev_allhit vs Nmixup

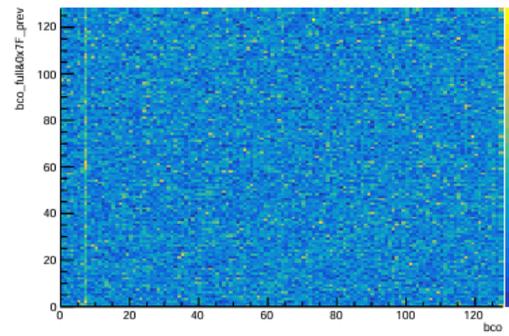


Mixup Multiplicity 22926

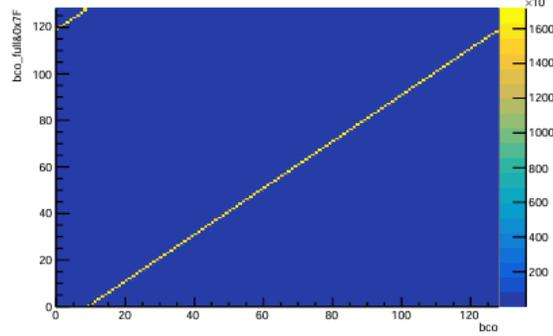


Run22979 intt1

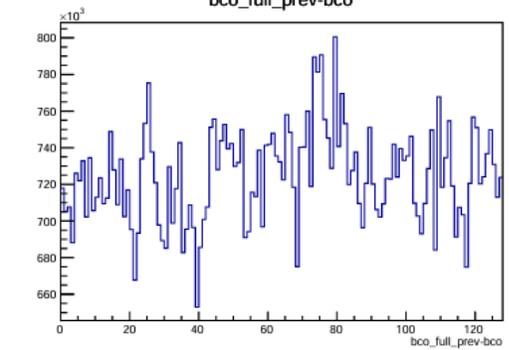
bco_full&0x7F_prev vs bco 22979



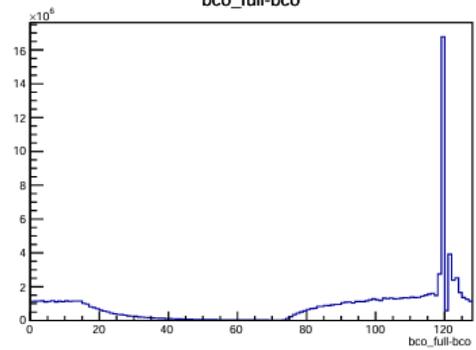
bco_full&0x7F vs bco



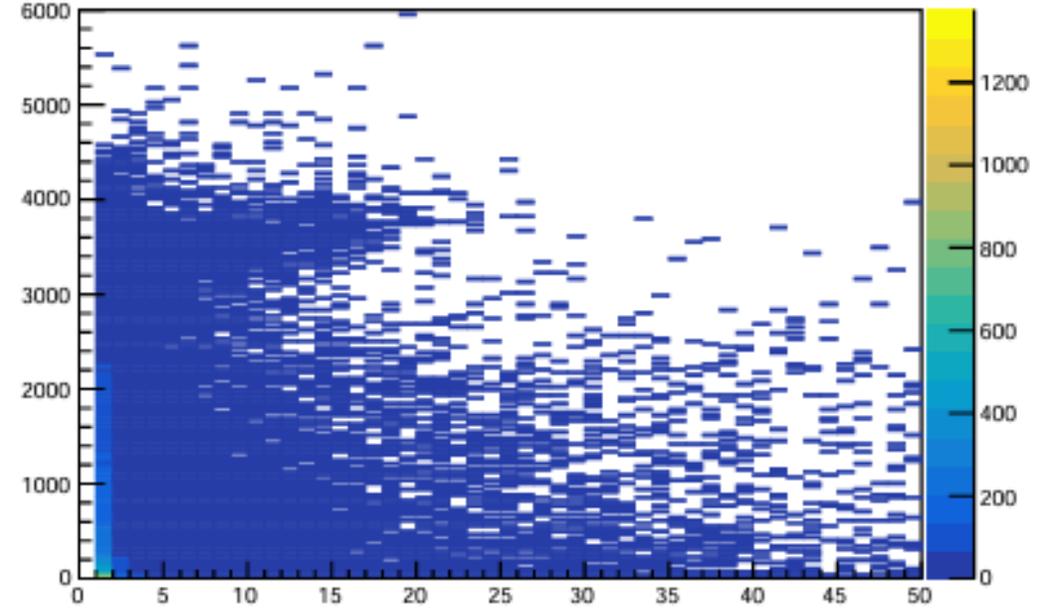
bco_full_prev-bco



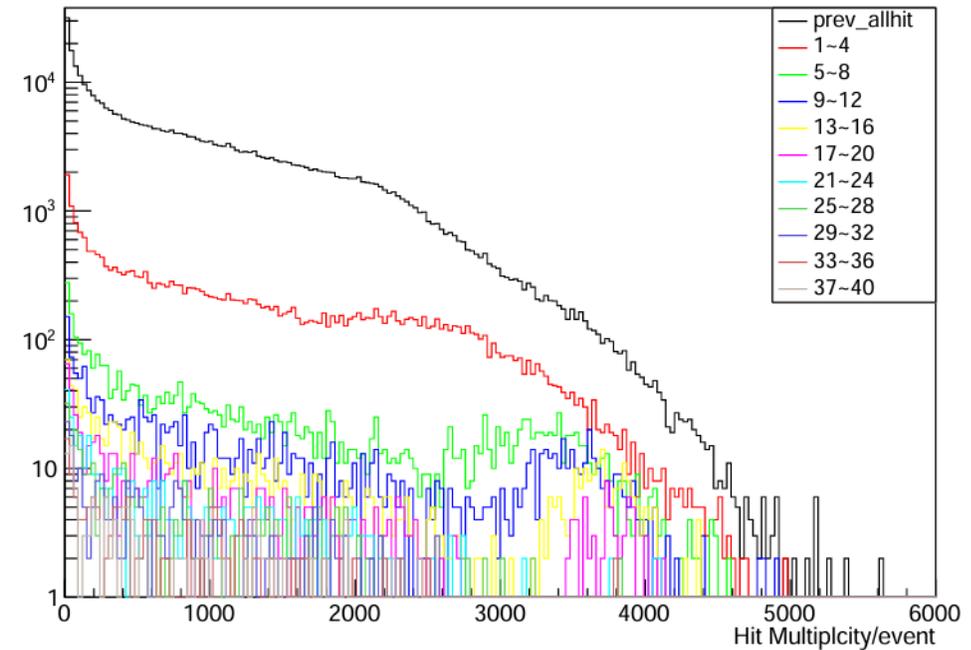
bco_full-bco



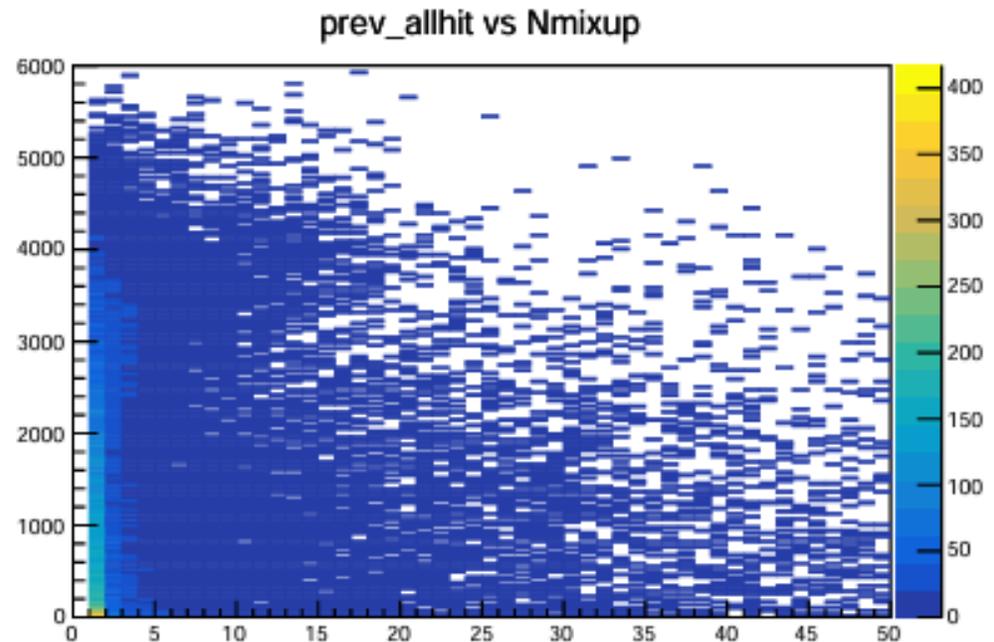
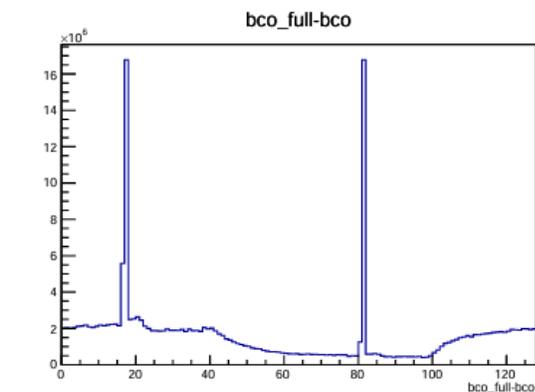
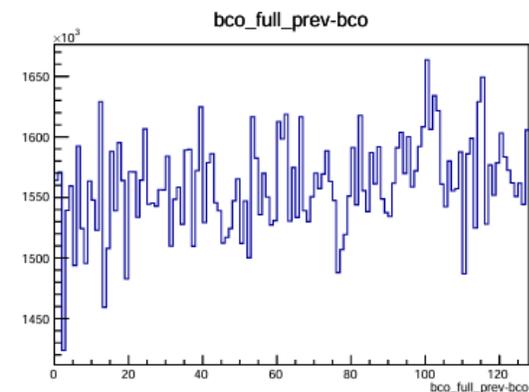
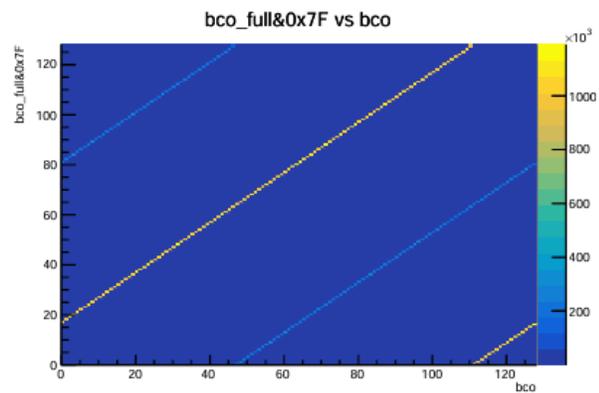
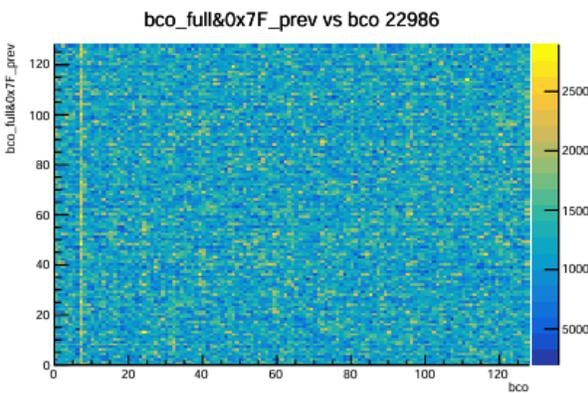
prev_allhit vs Nmixup



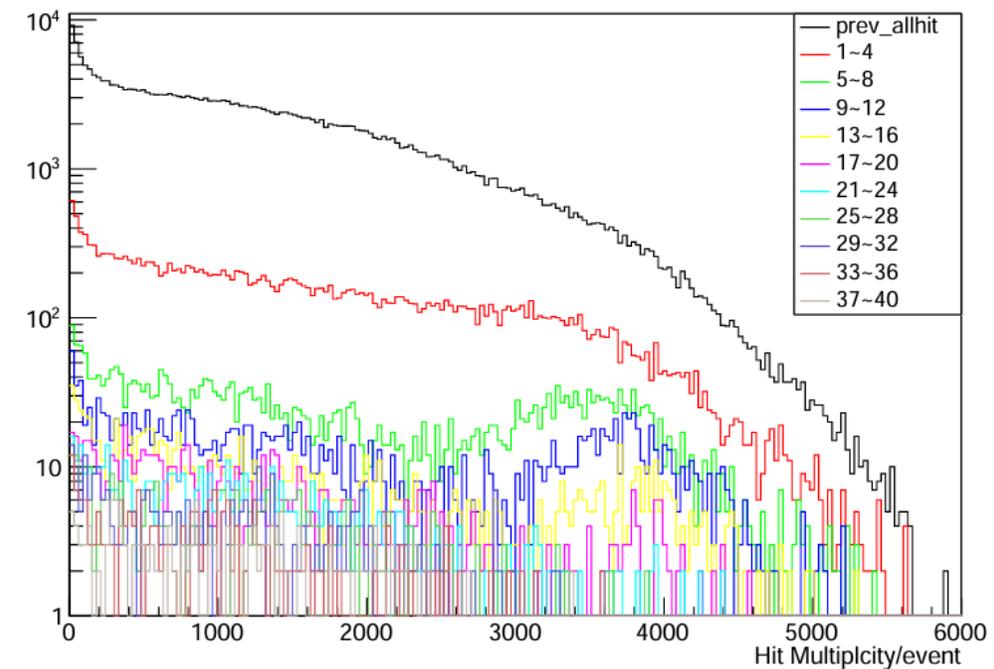
Mixup Multiplicity 22979



Run22986 intt1

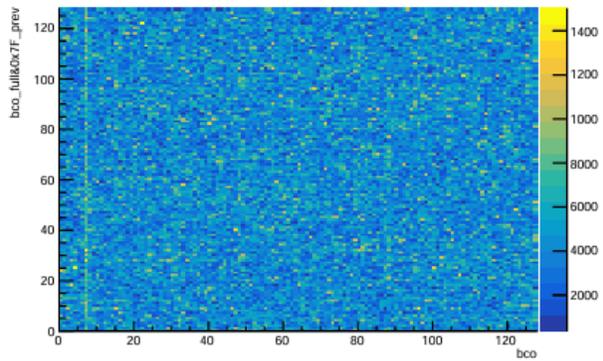


Mixup Multiplicity 22986

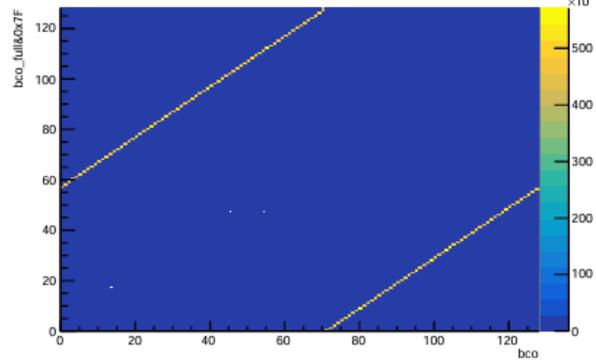


Run22987 intt1

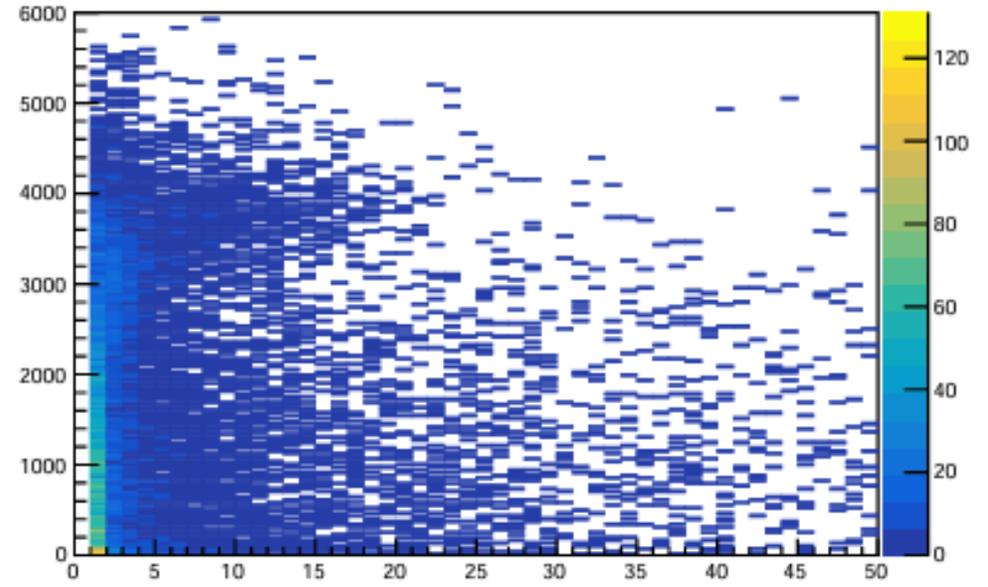
bco_full&0x7F_prev vs bco 22987



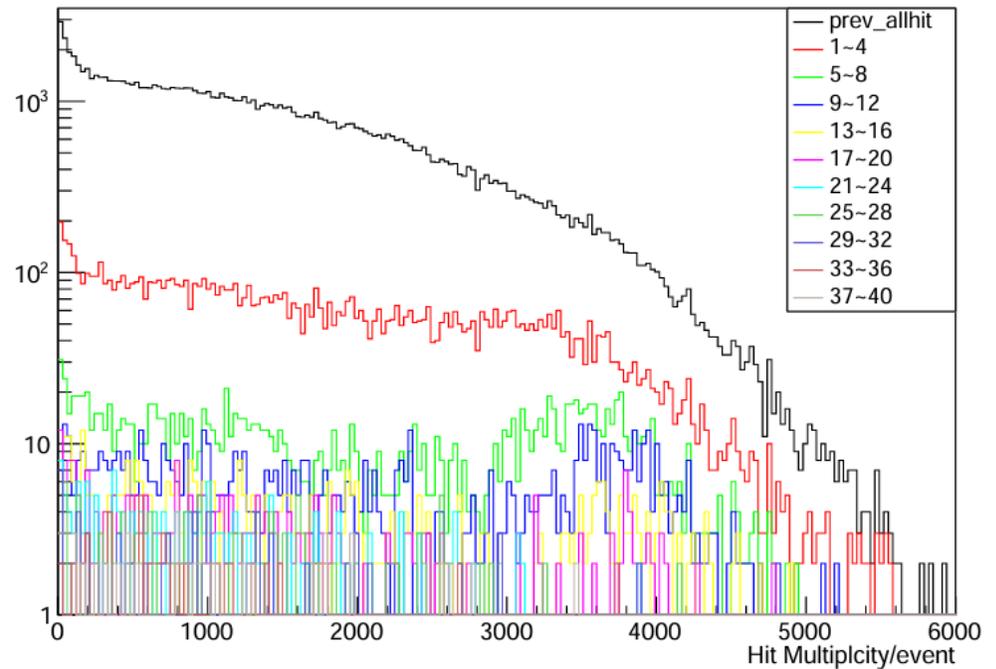
bco_full&0x7F vs bco



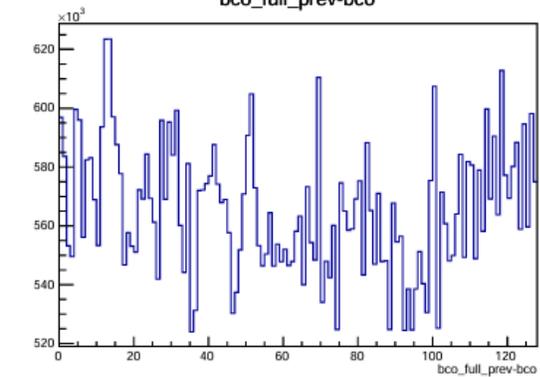
prev_allhit vs Nmixup



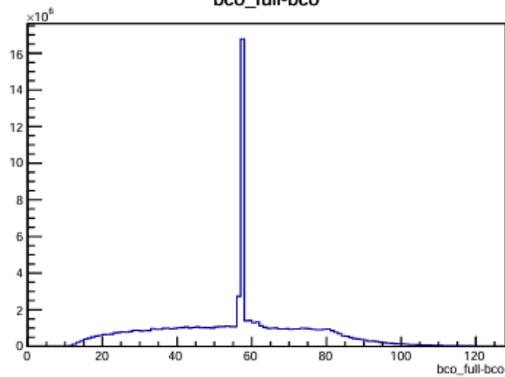
Mixup Multiplicity 22987



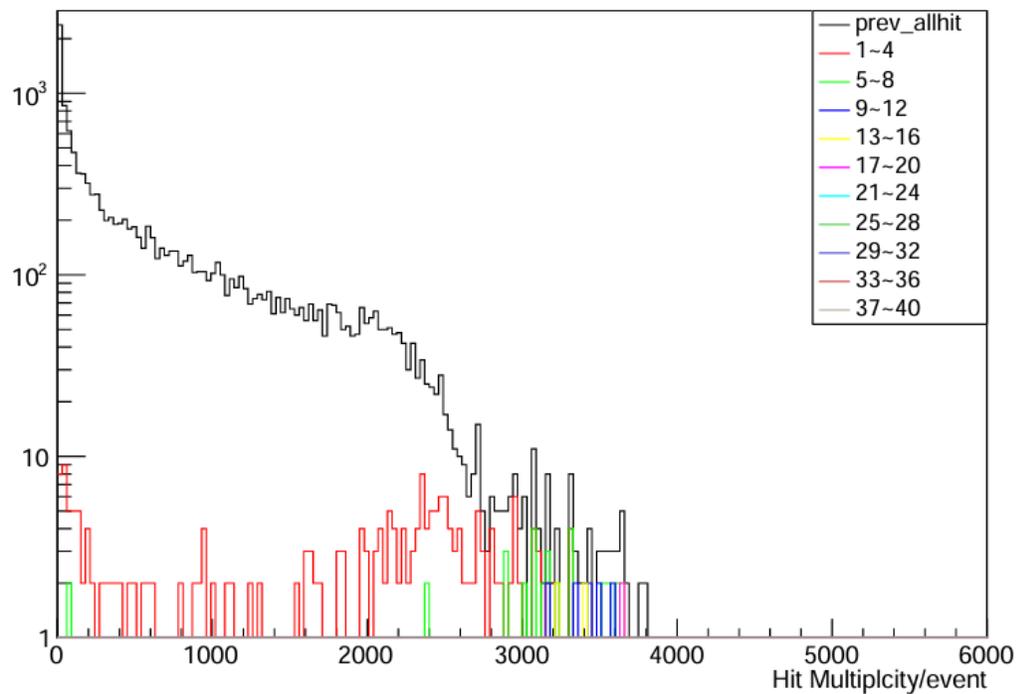
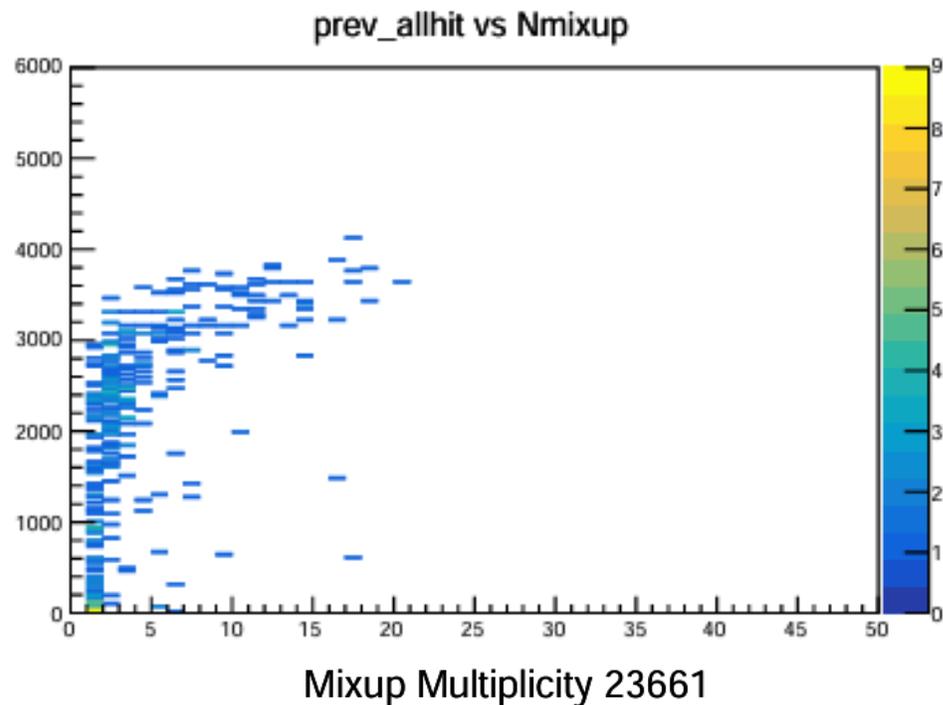
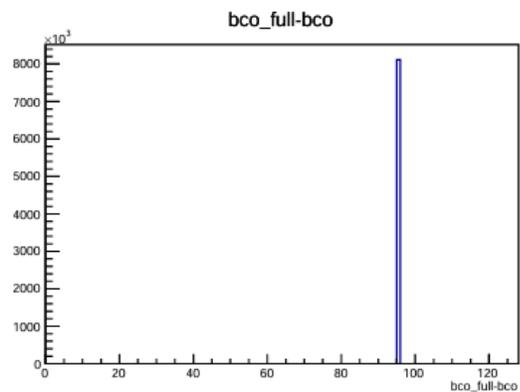
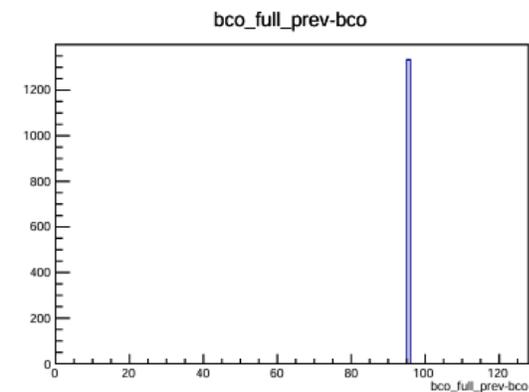
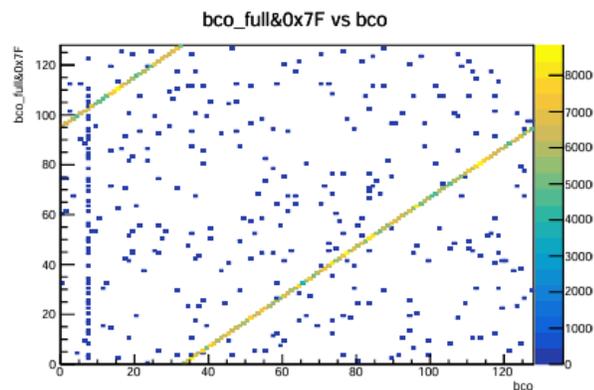
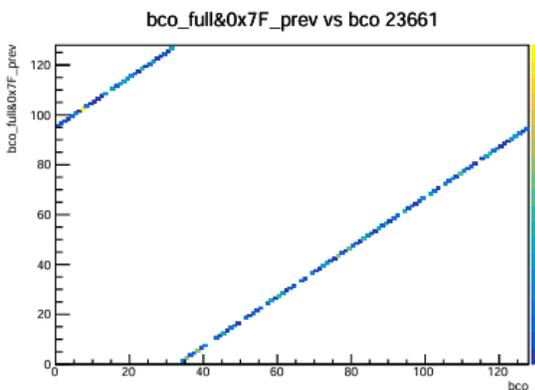
bco_full_prev-bco



bco_full-bco

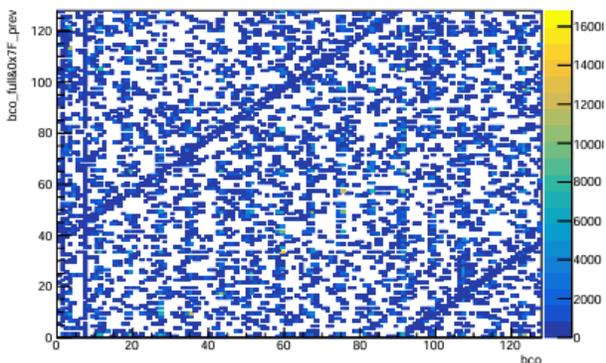


Run23661 intt1

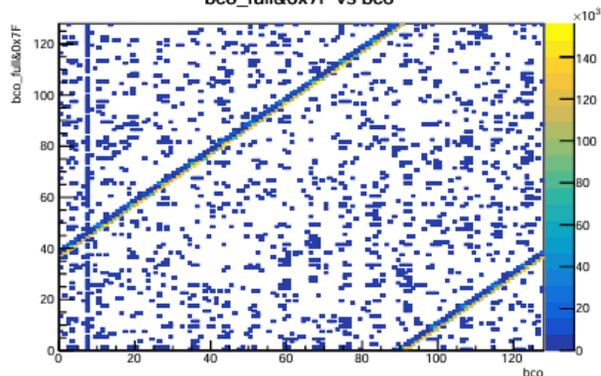


Run23896 intt1

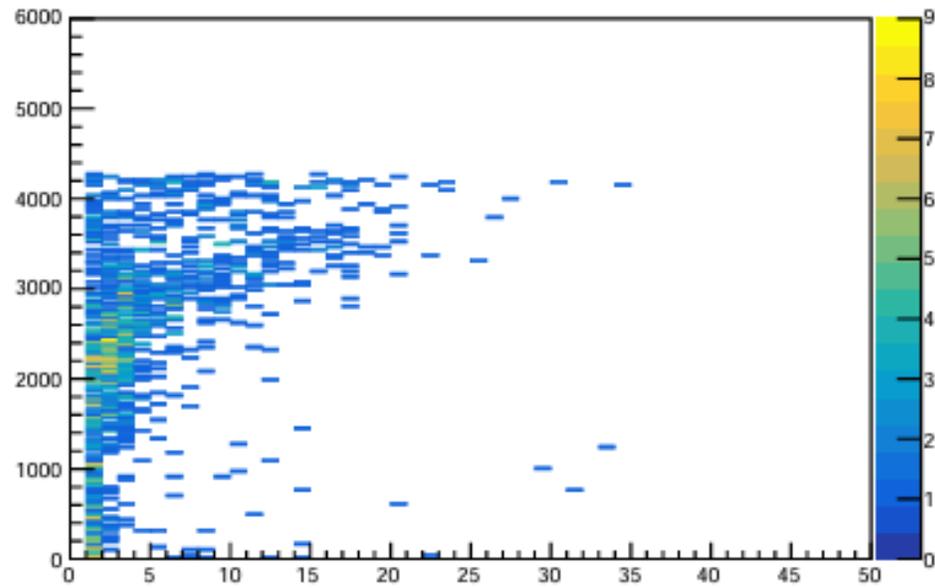
bco_full&0x7F_prev vs bco 23896



bco_full&0x7F vs bco

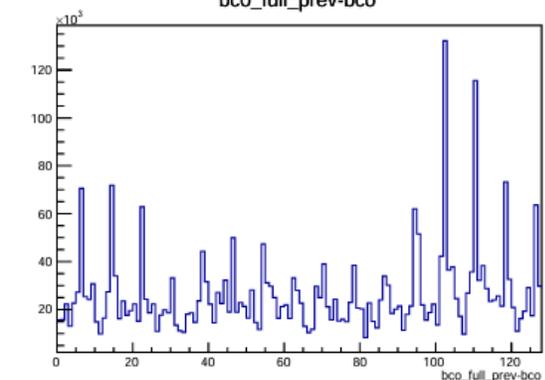


prev_allhit vs Nmixup

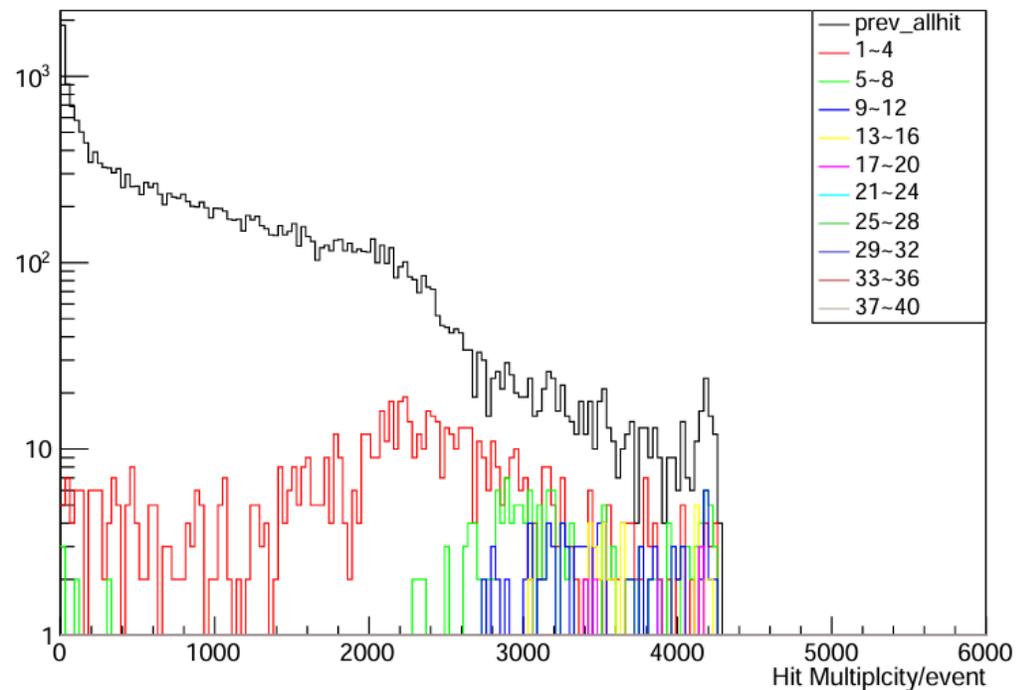
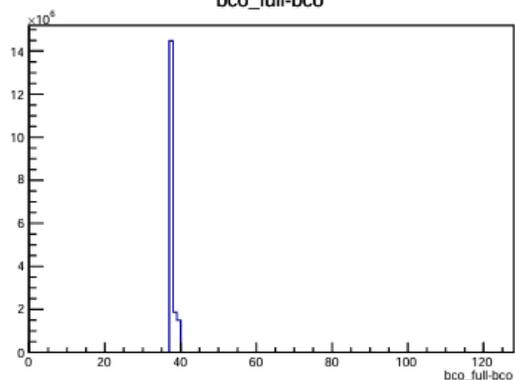


Mixup Multiplicity 23896

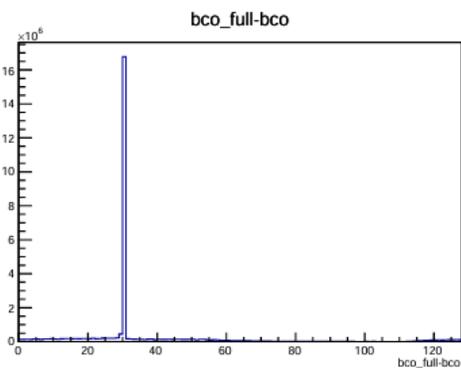
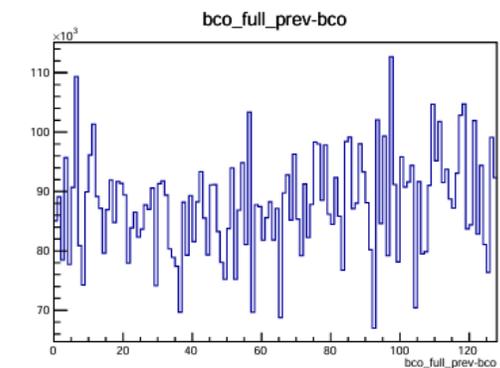
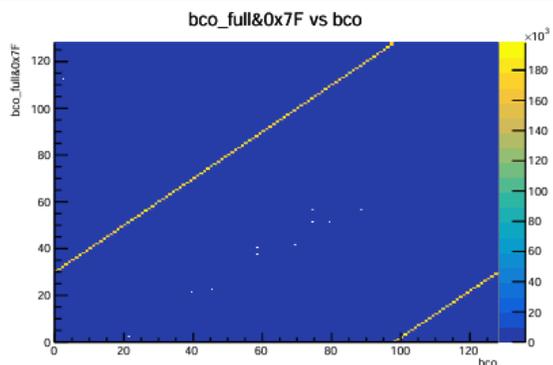
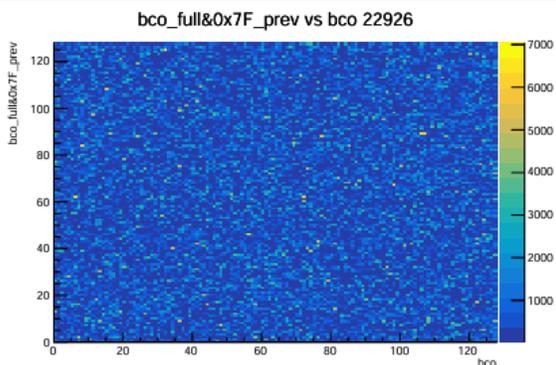
bco_full_prev-bco



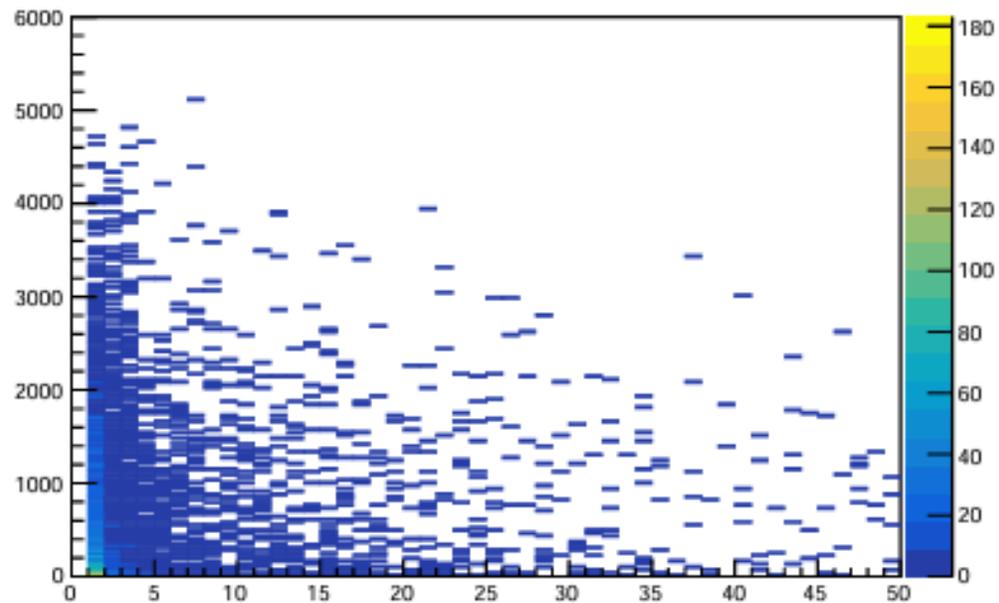
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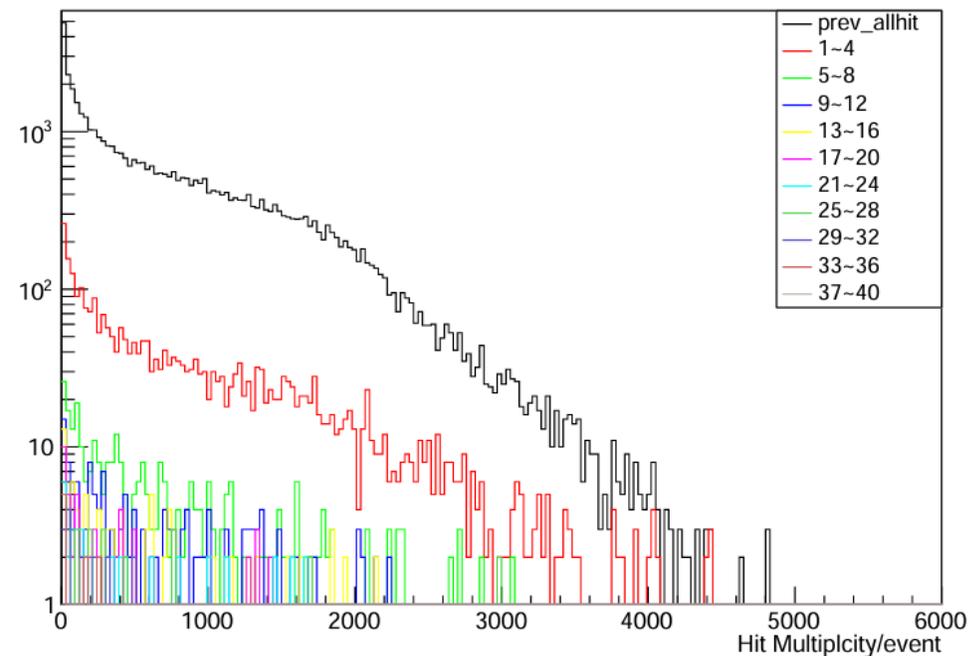
Run22926 intt2



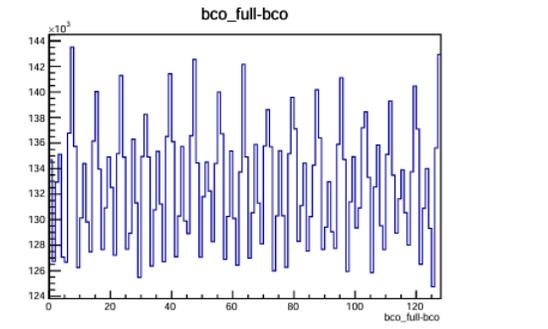
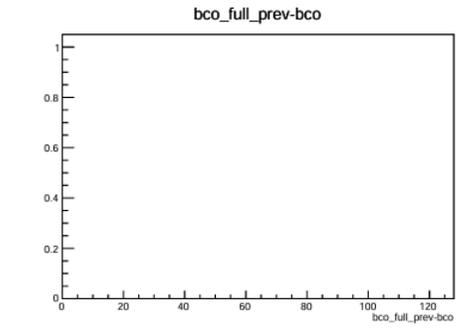
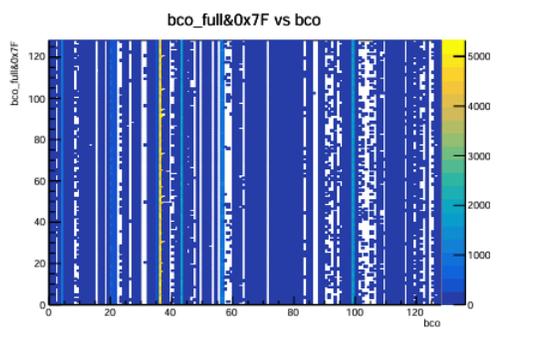
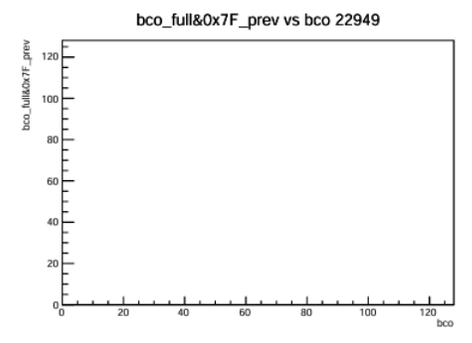
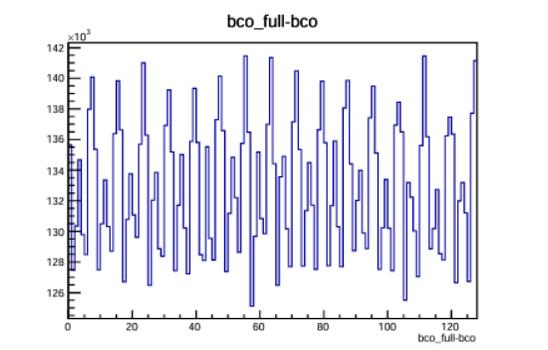
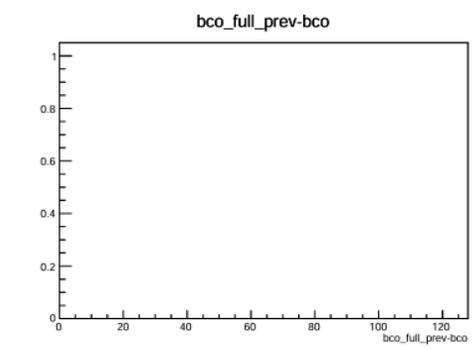
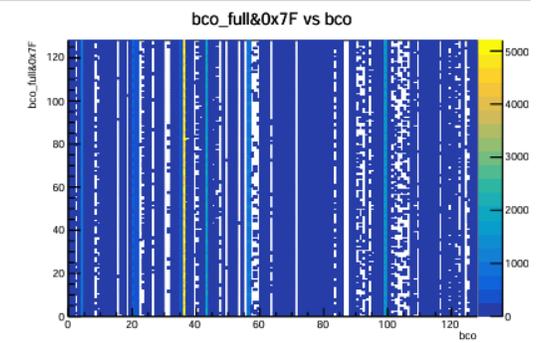
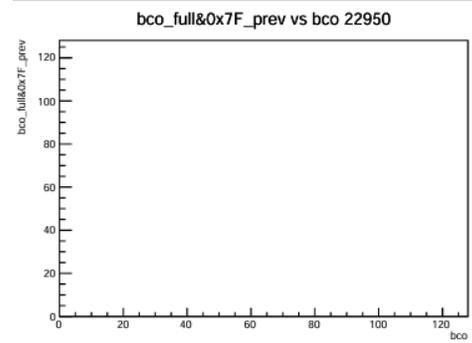
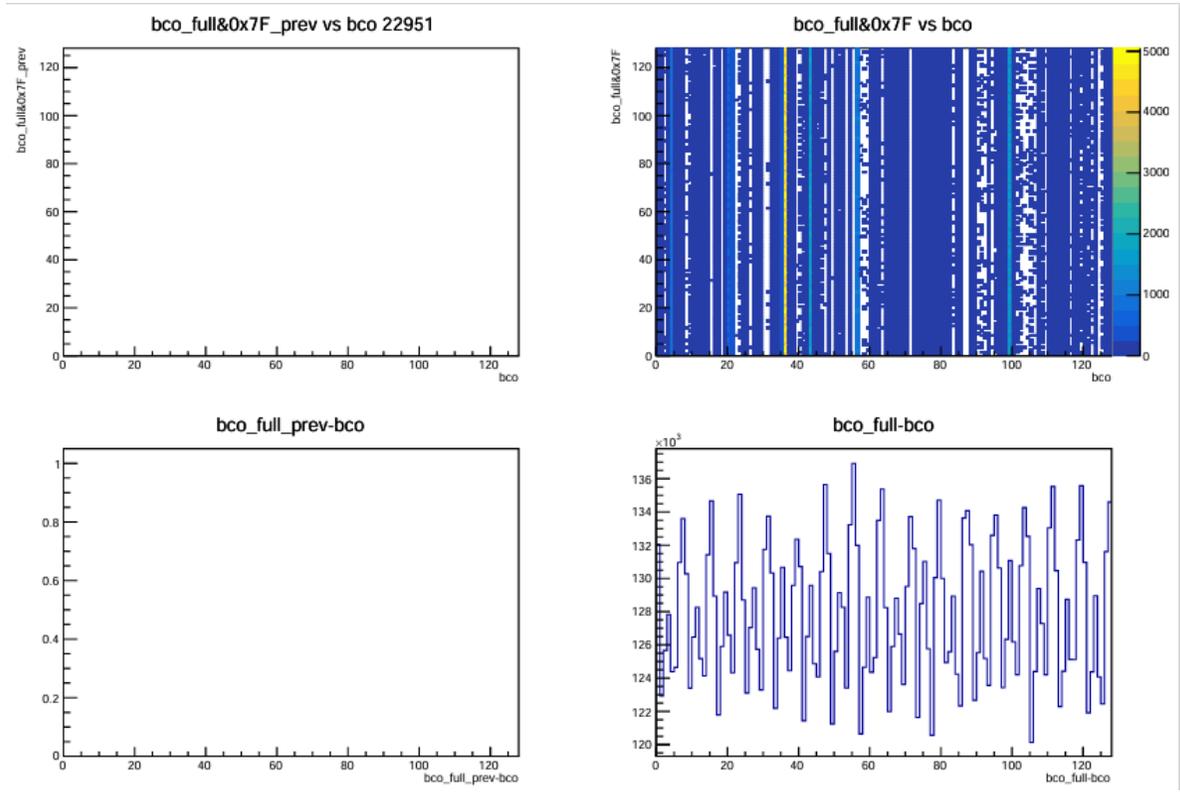
prev_allhit vs Nmixup



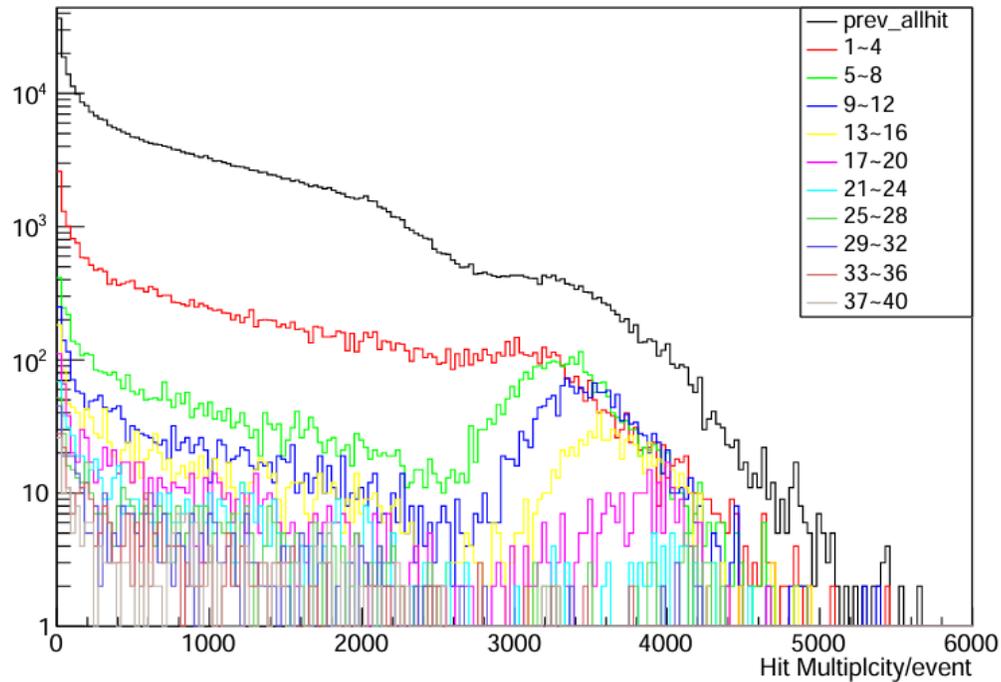
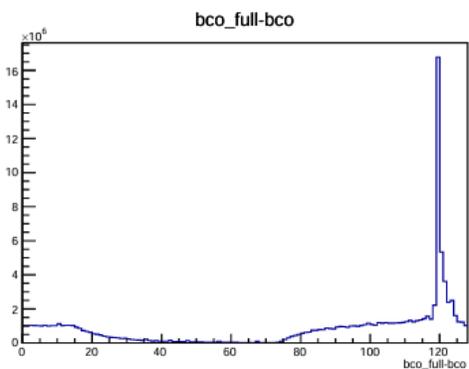
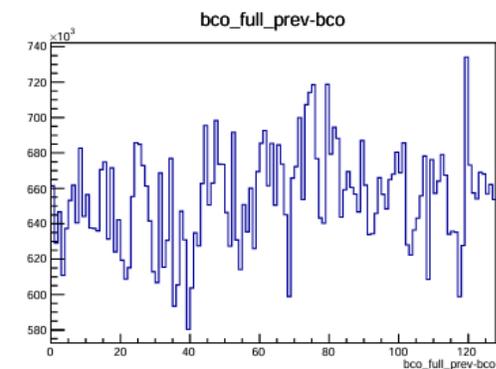
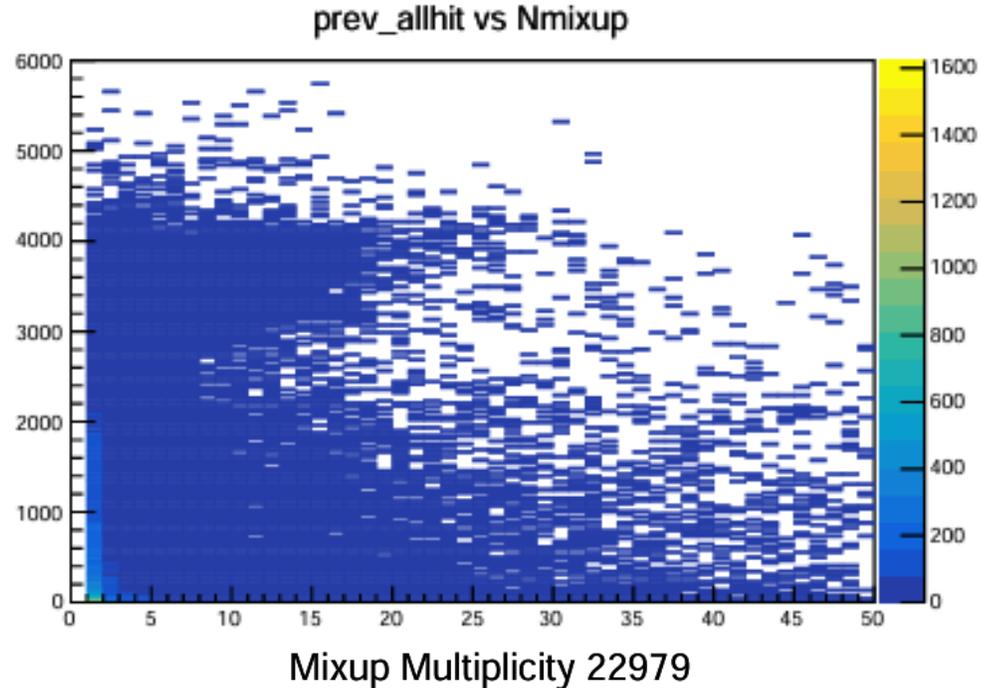
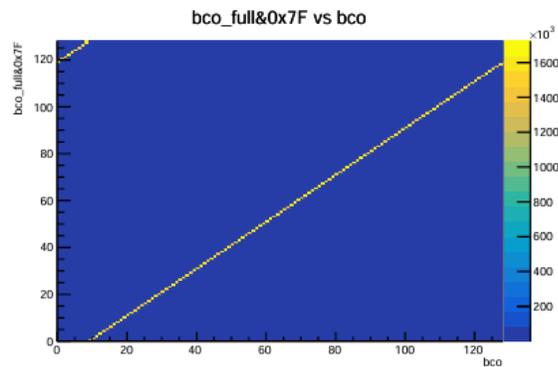
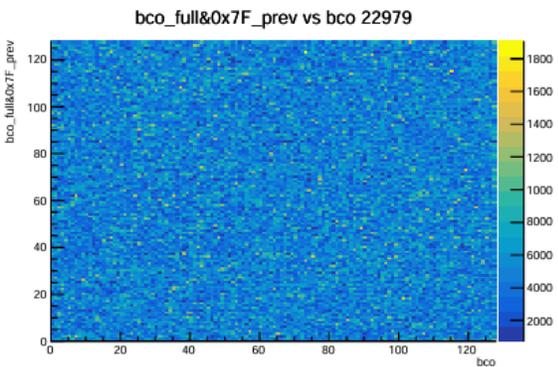
Mixup Multiplicity 22926



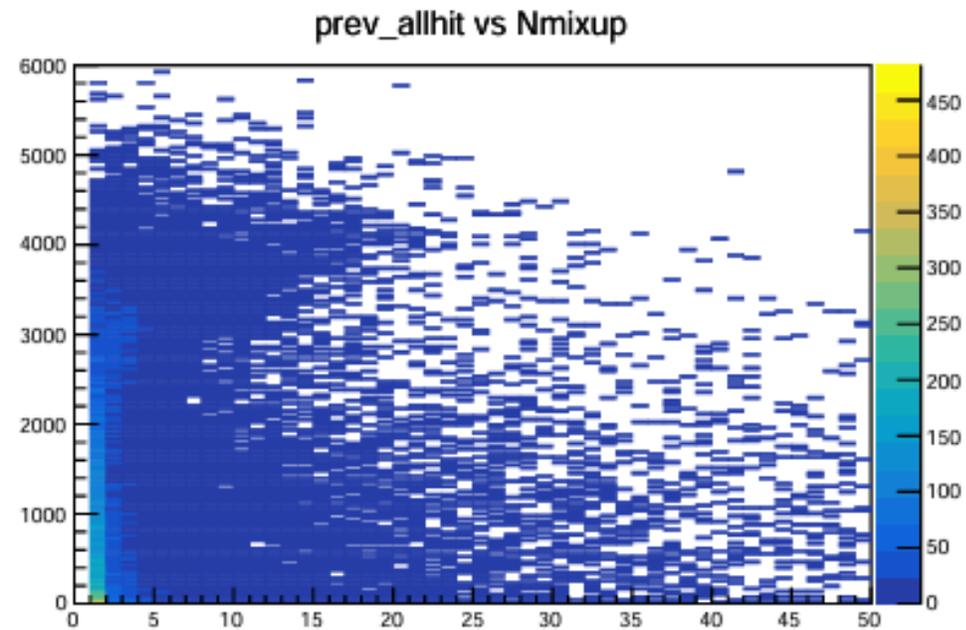
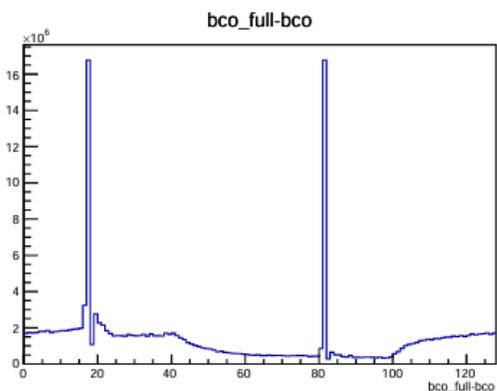
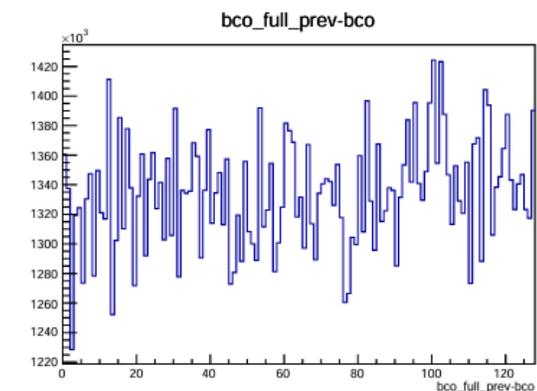
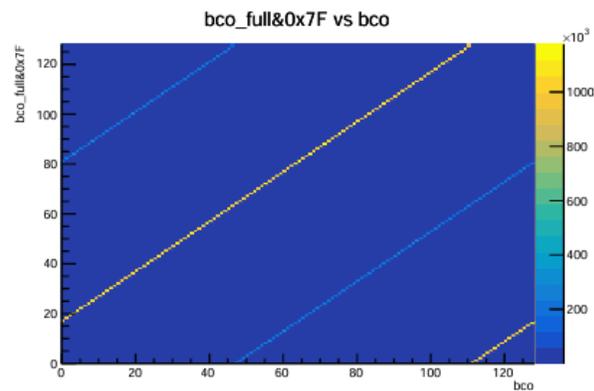
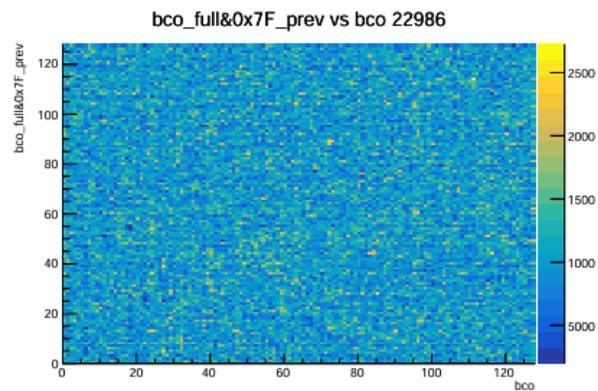
Run22951,22950, 22949 intt2



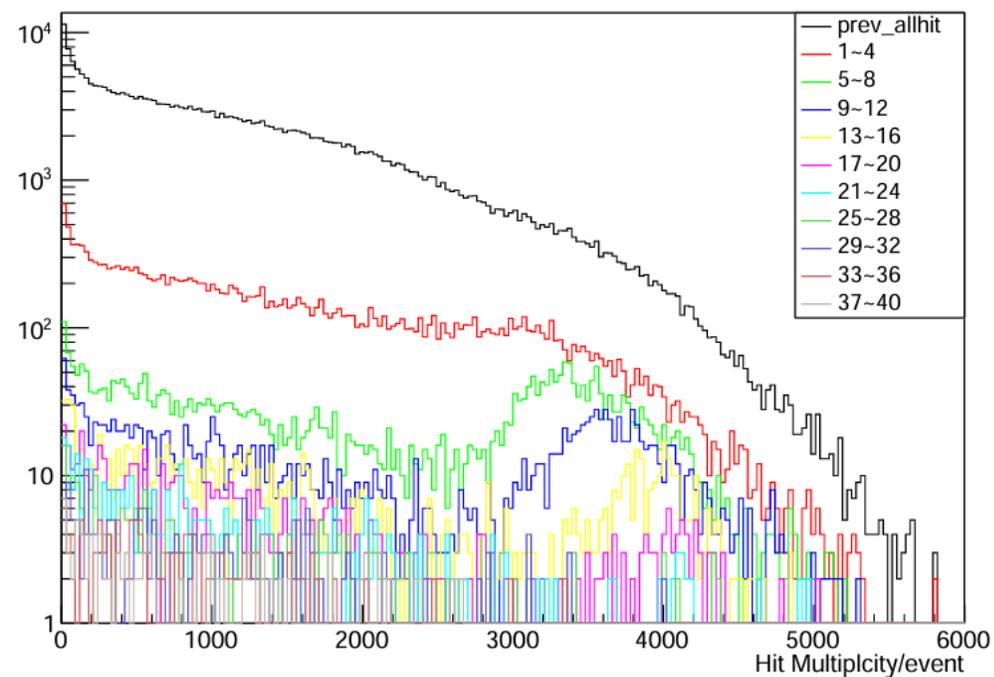
Run22979 intt2



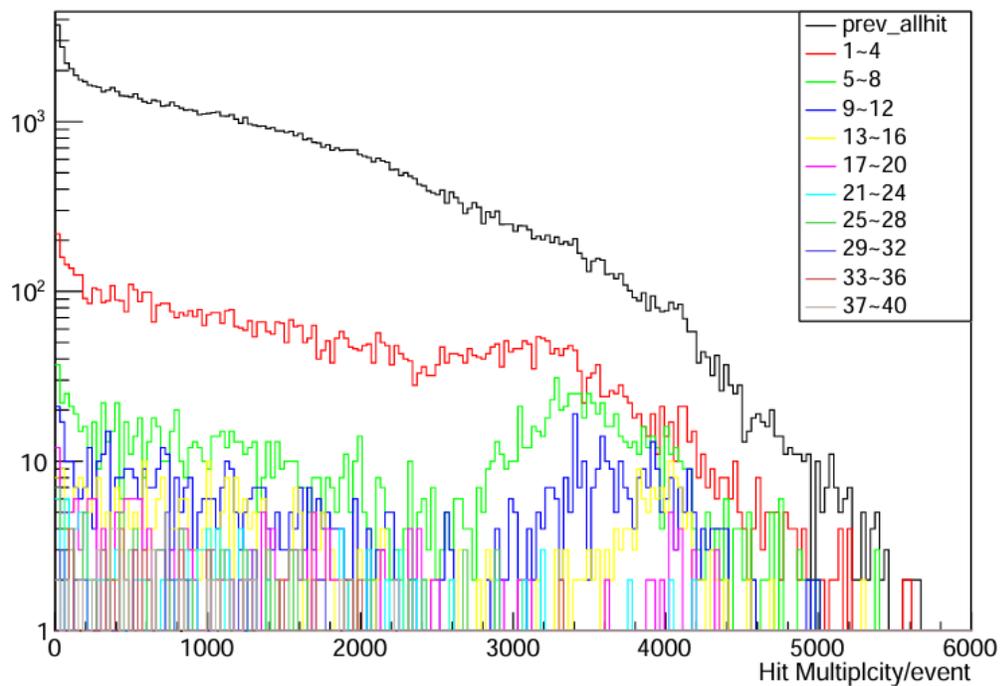
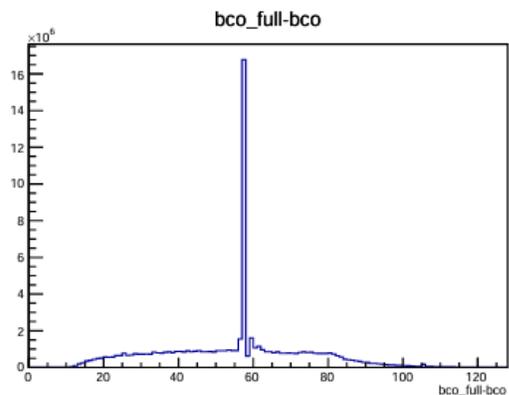
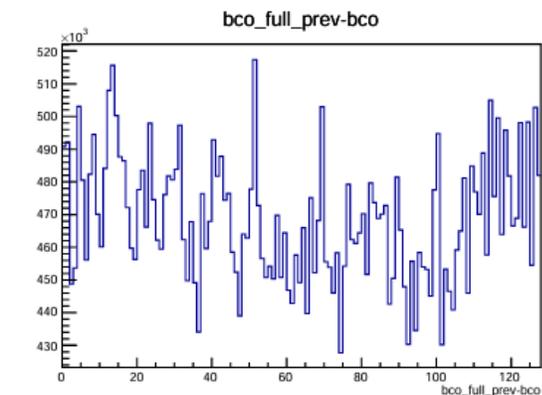
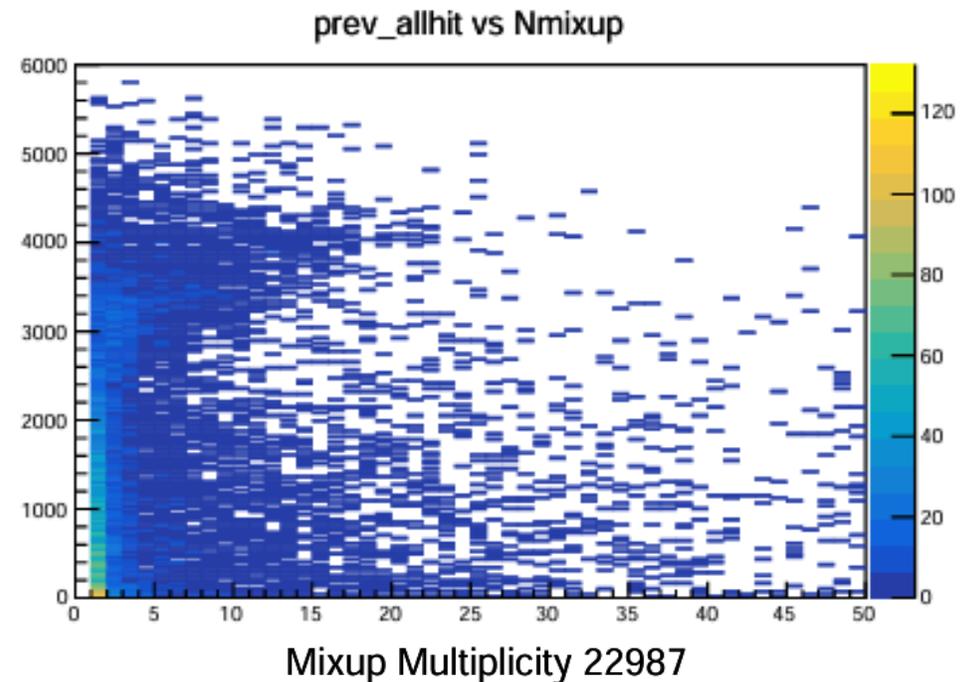
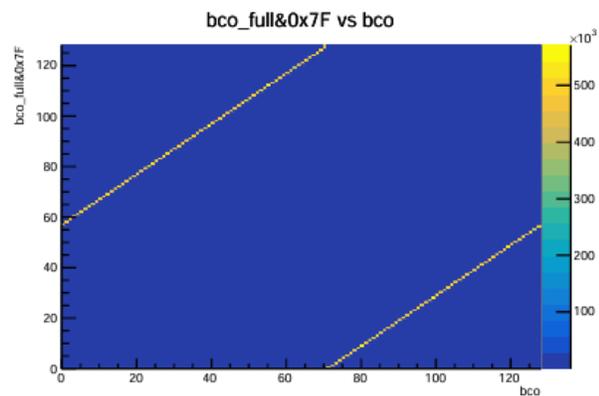
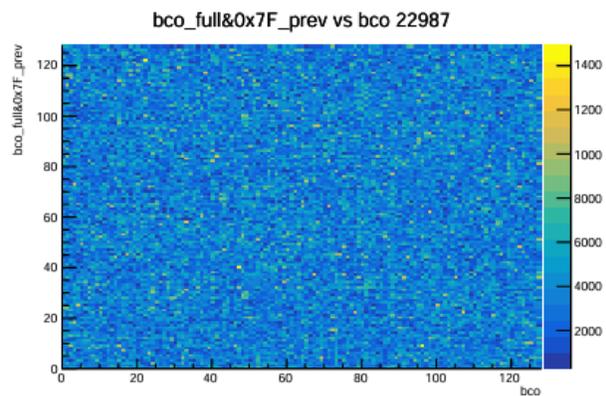
Run22986 intt2



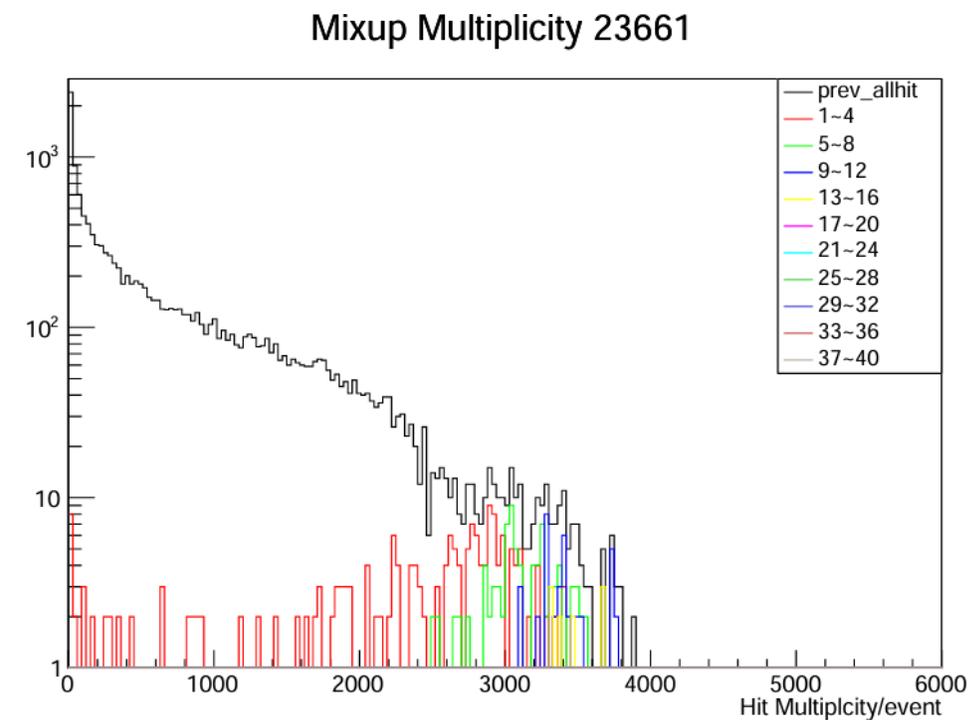
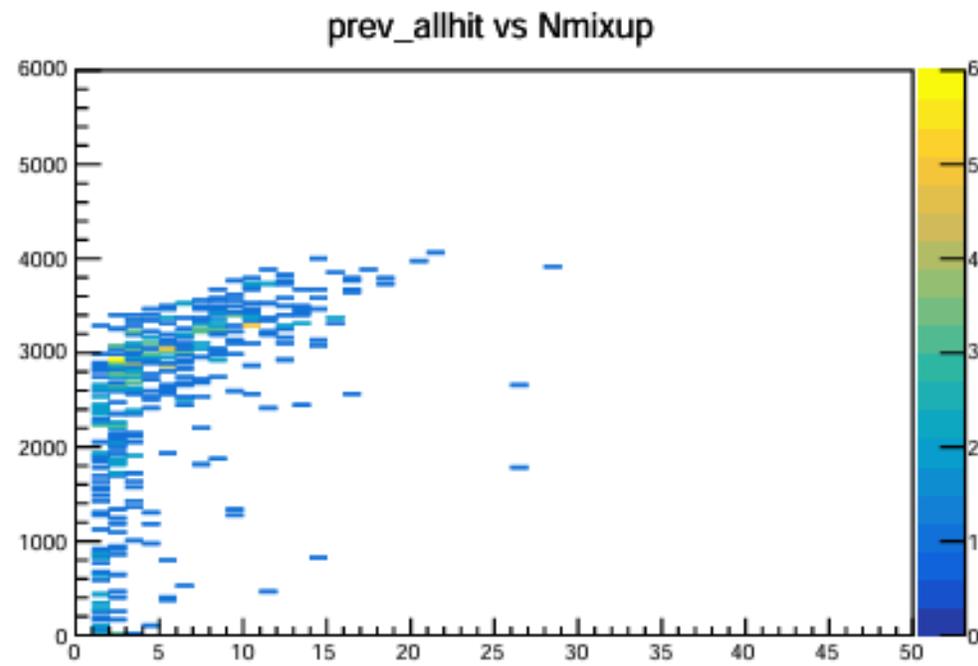
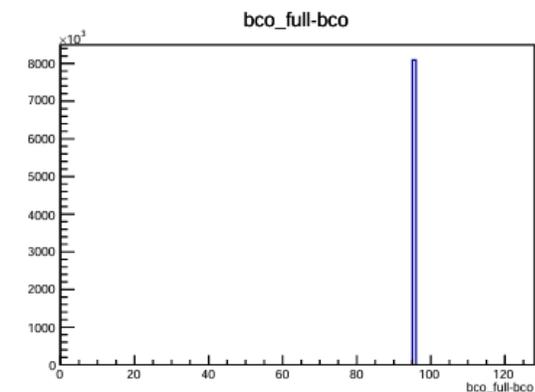
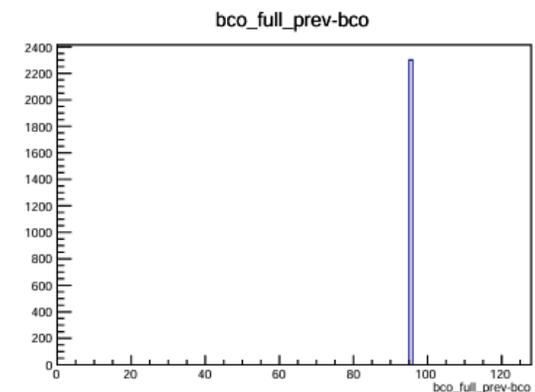
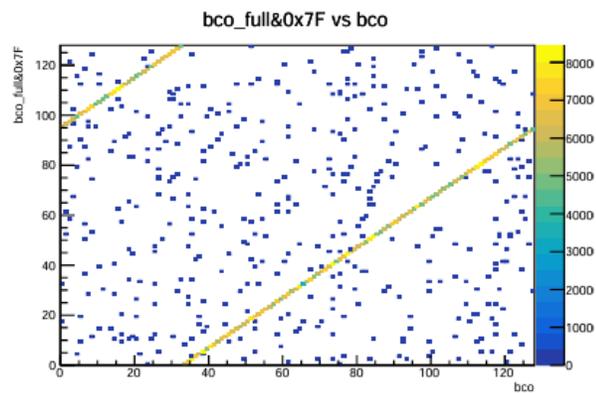
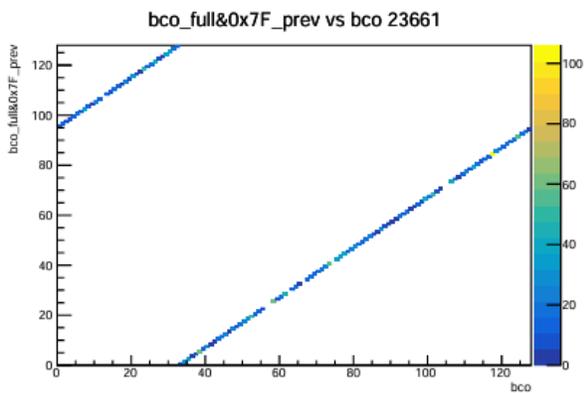
Mixup Multiplicity 22986



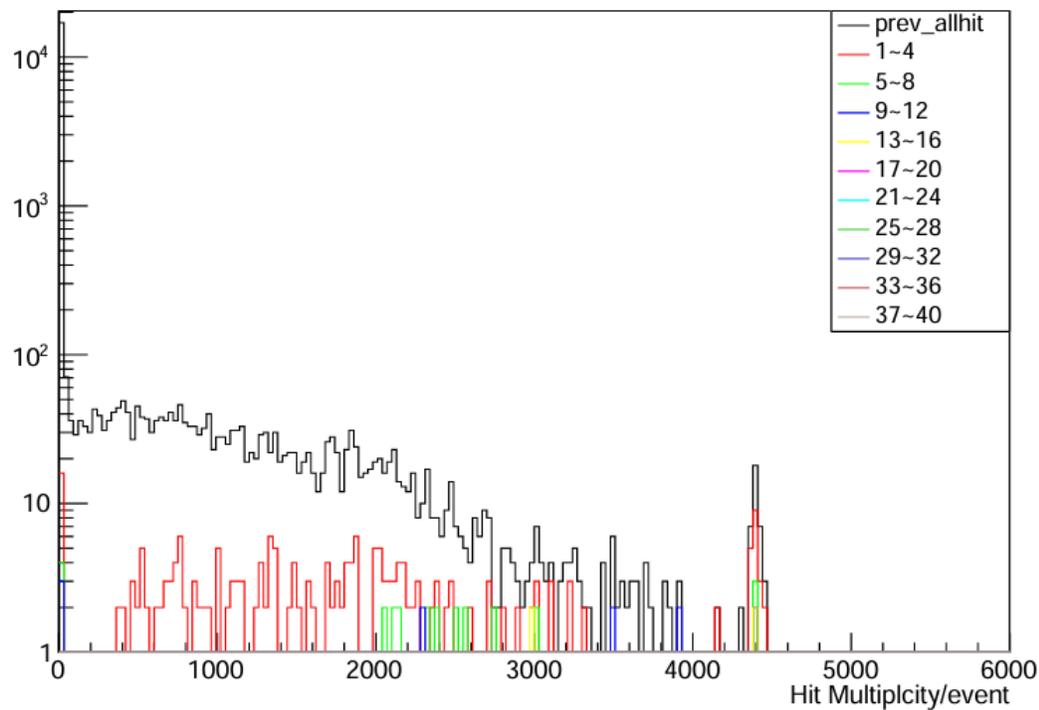
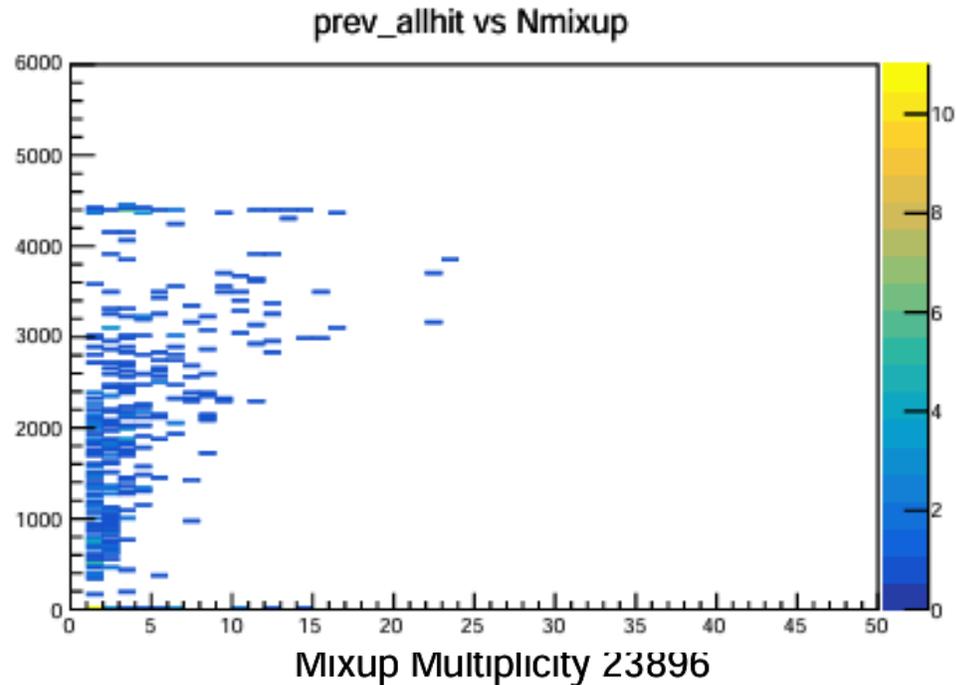
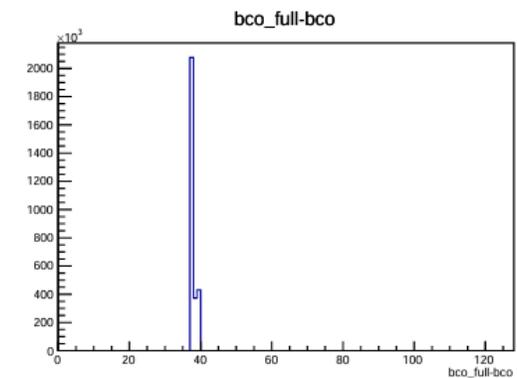
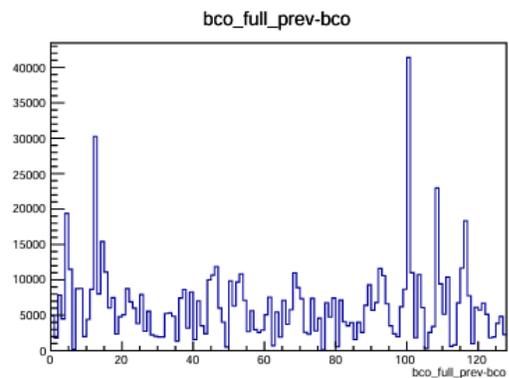
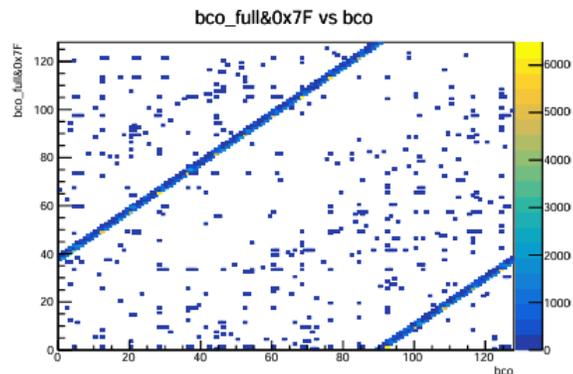
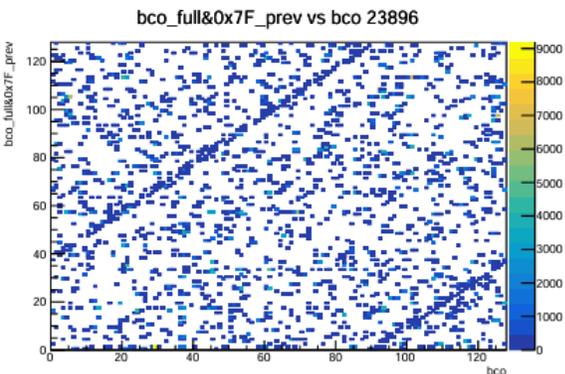
Run22987 intt2



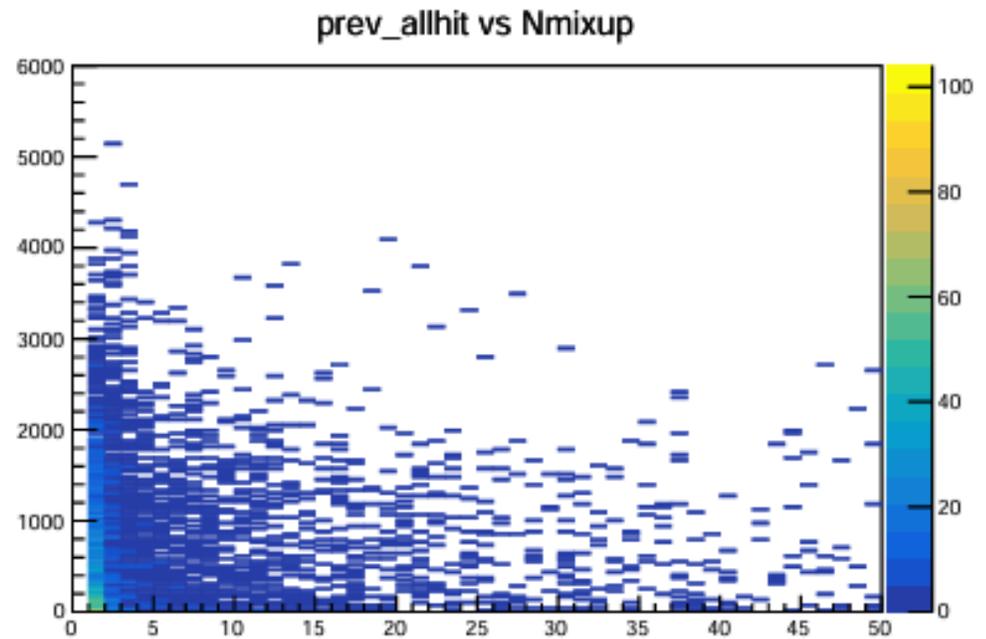
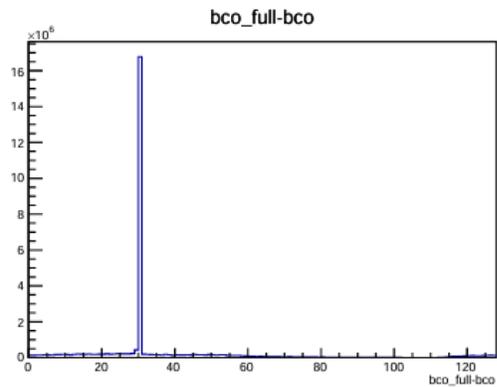
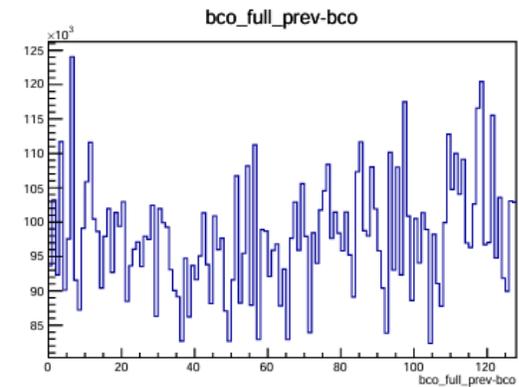
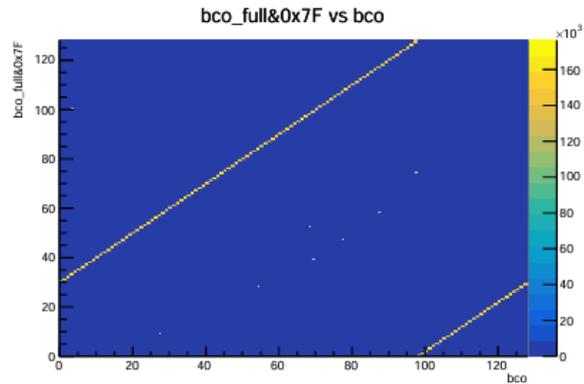
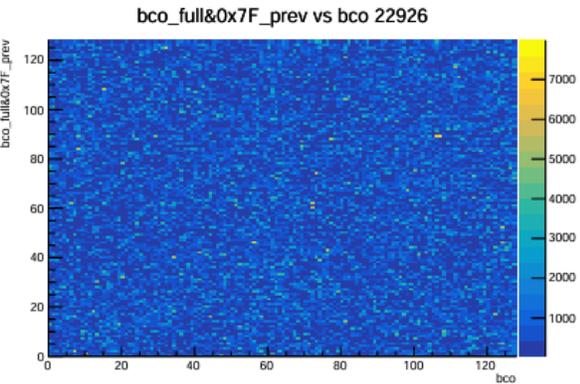
Run23661 intt2



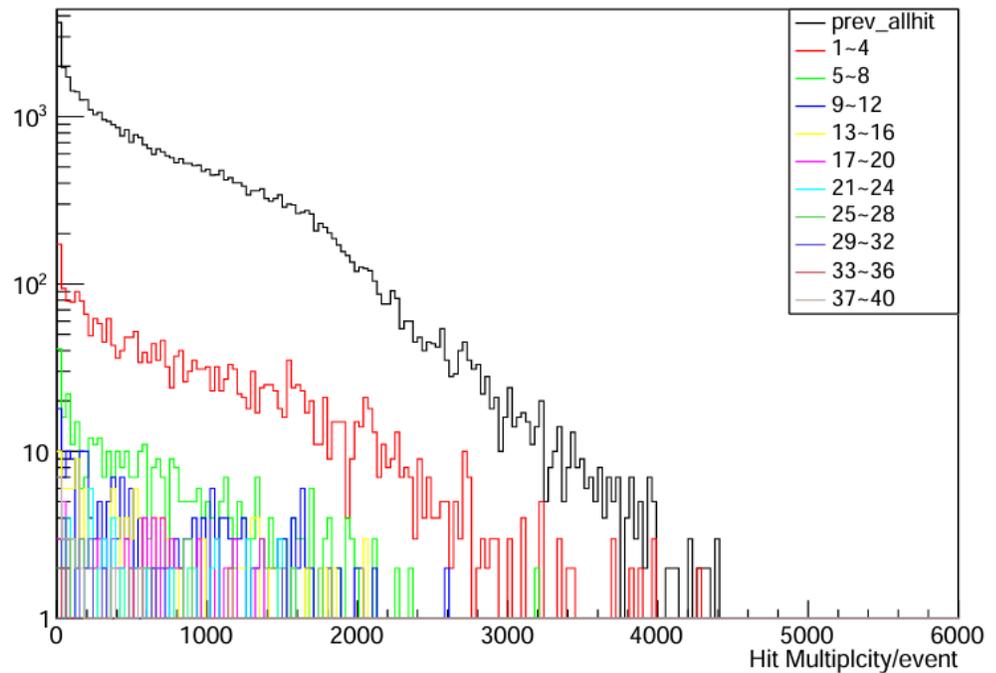
Run23896 intt2



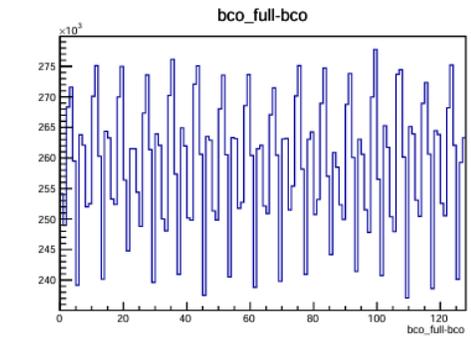
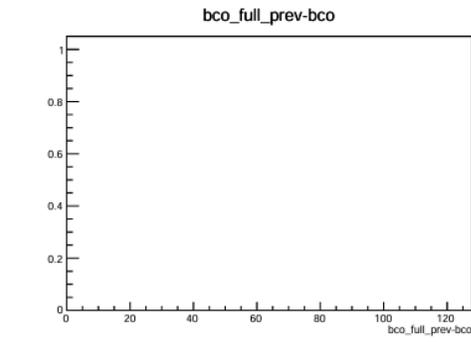
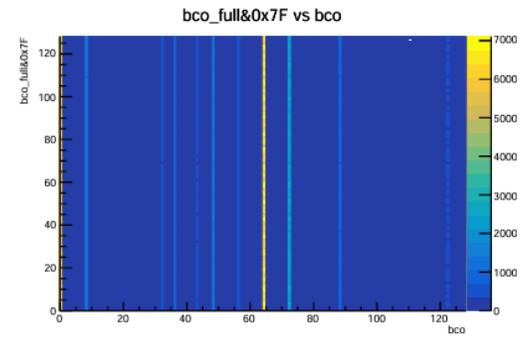
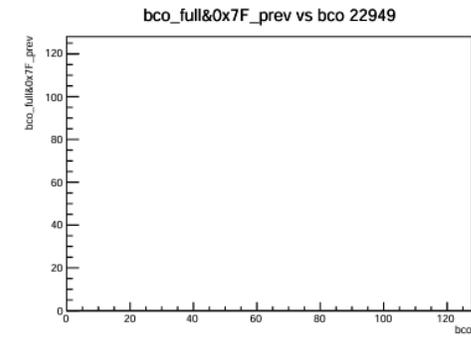
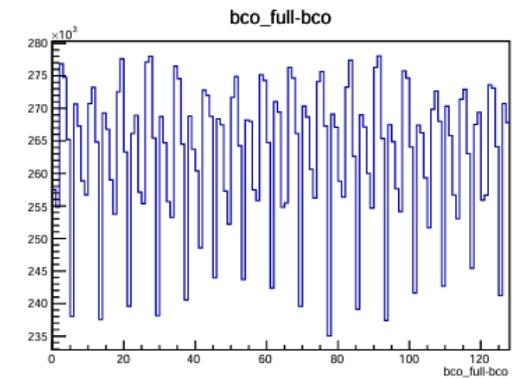
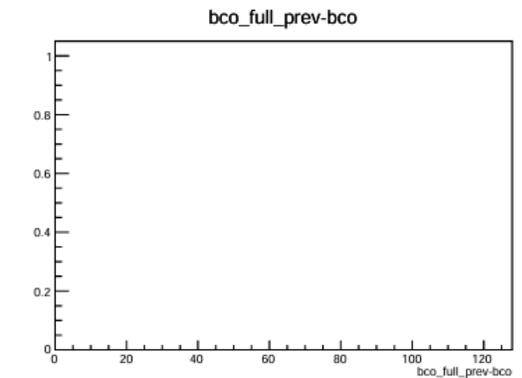
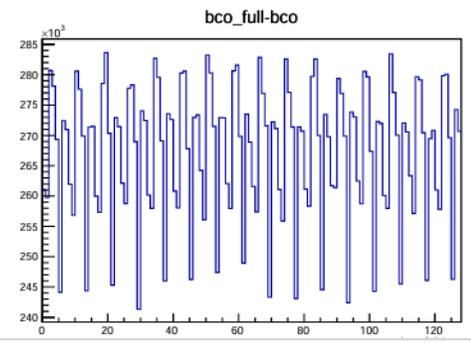
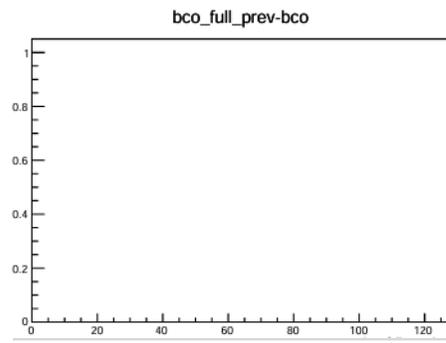
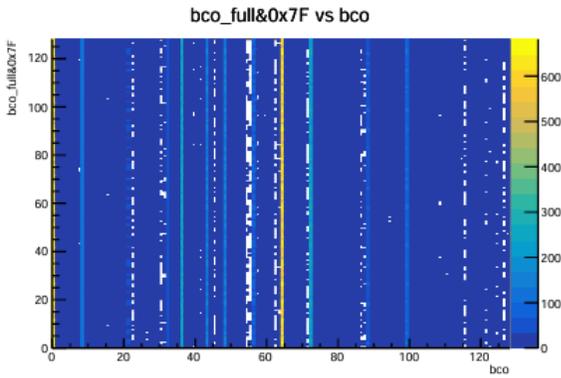
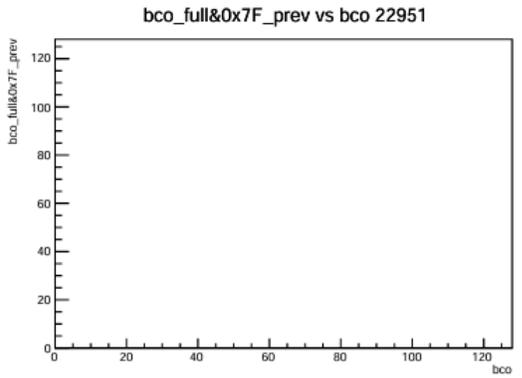
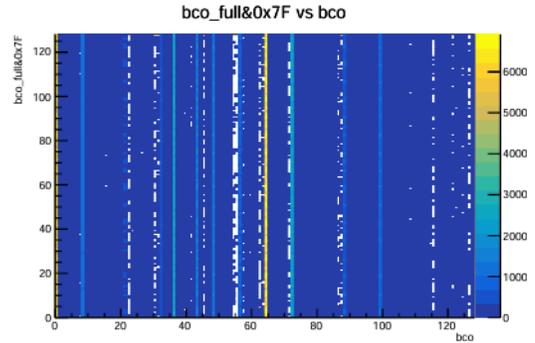
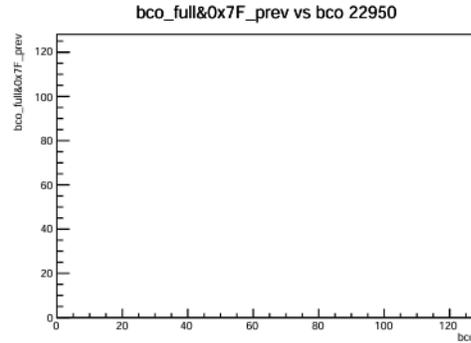
Run22926 intt3



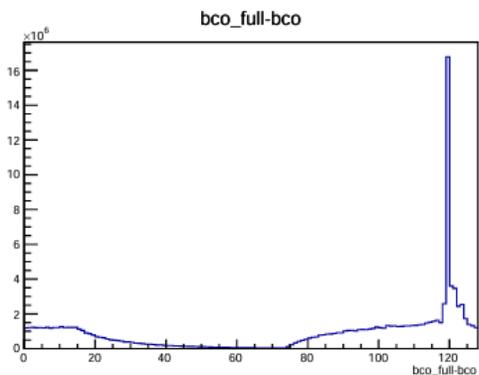
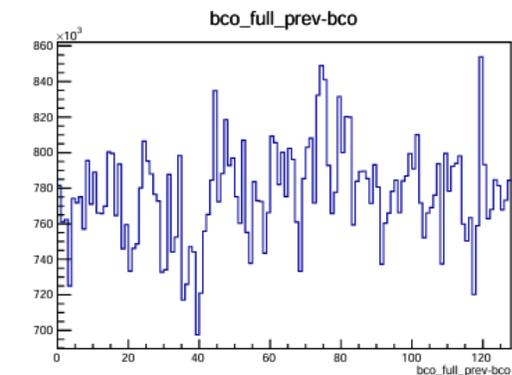
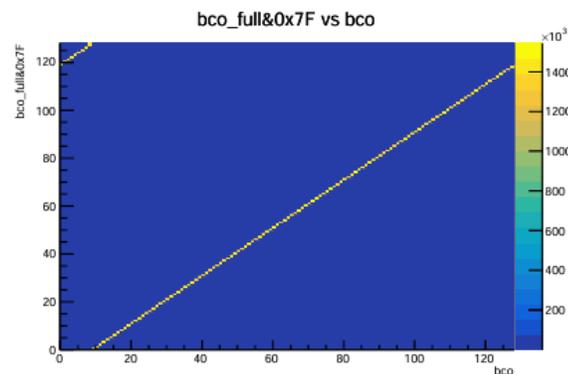
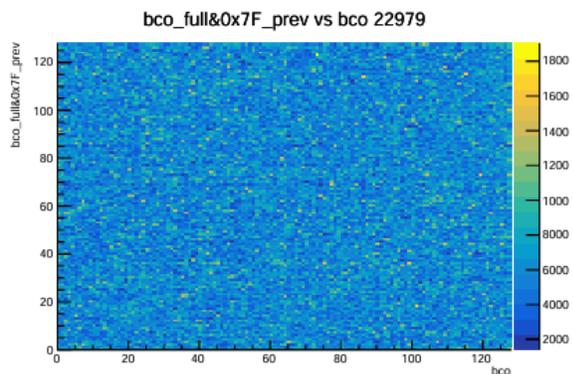
Mixup Multiplicity 22926



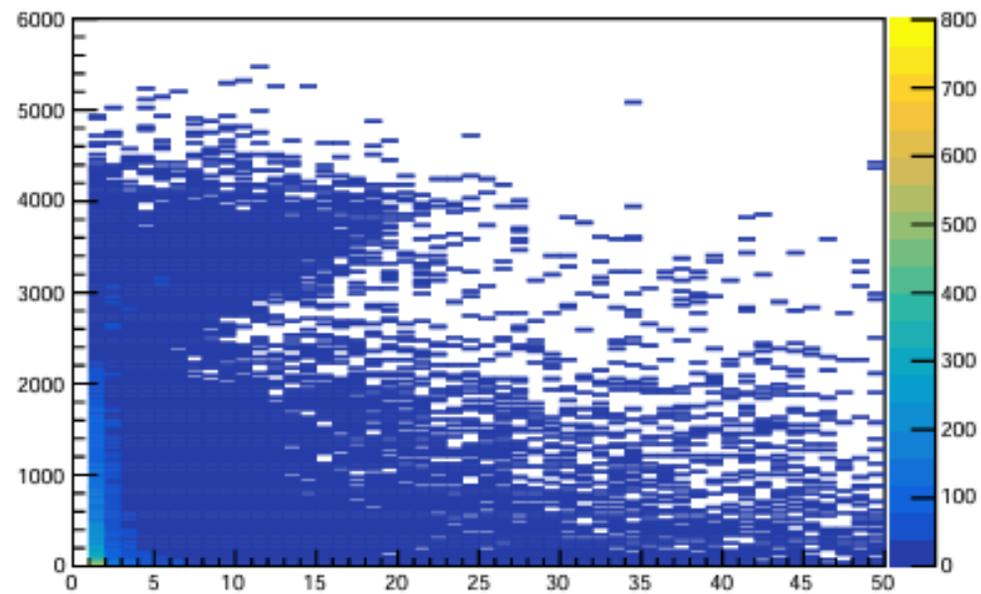
Run22951,22950, 229494 intt3



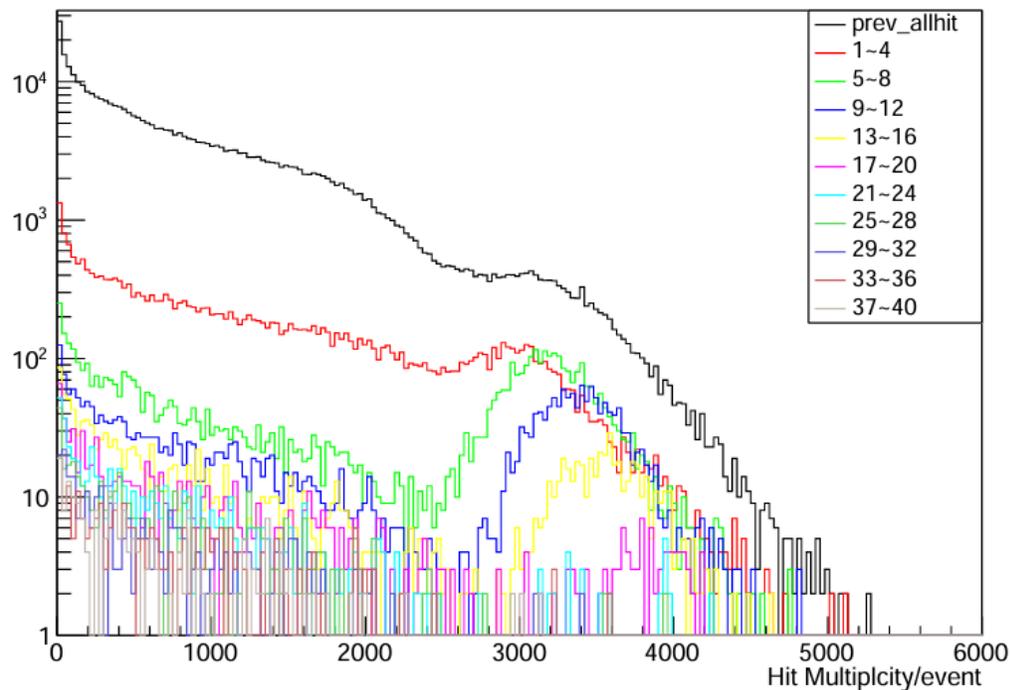
Run22979 intt3



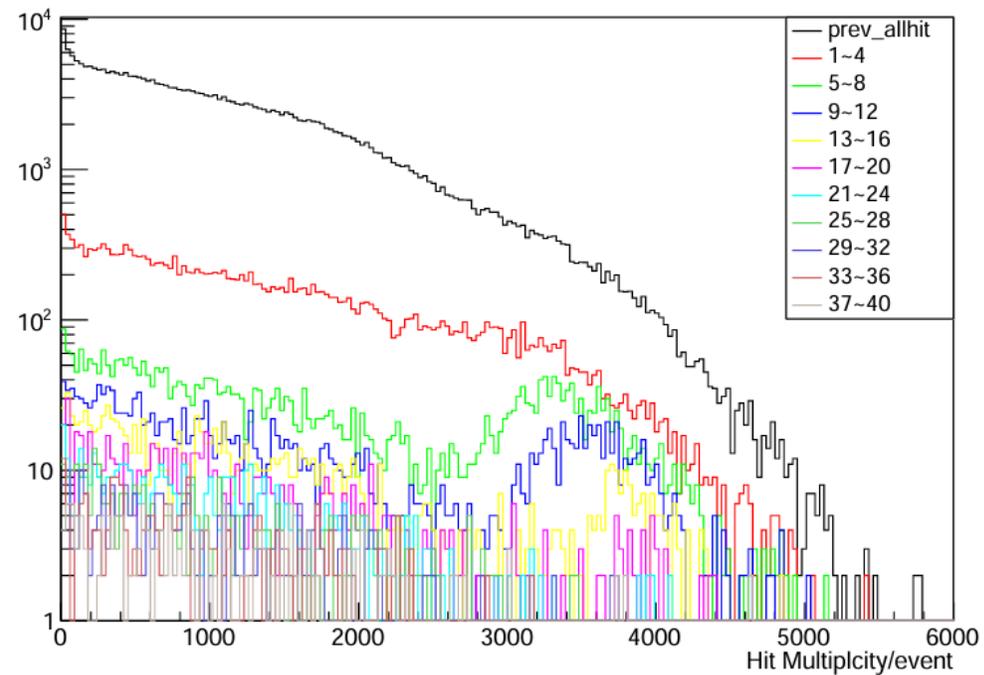
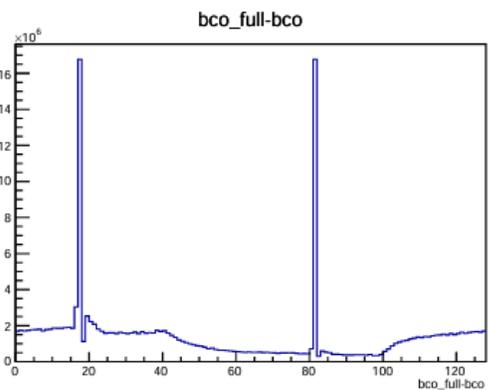
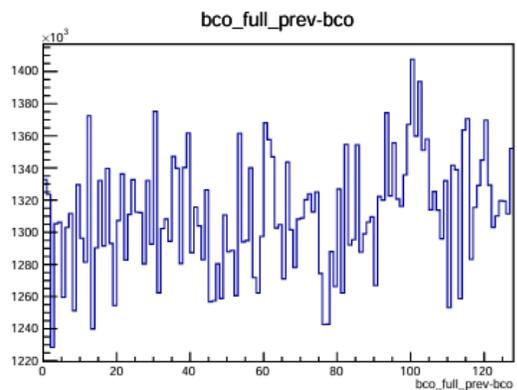
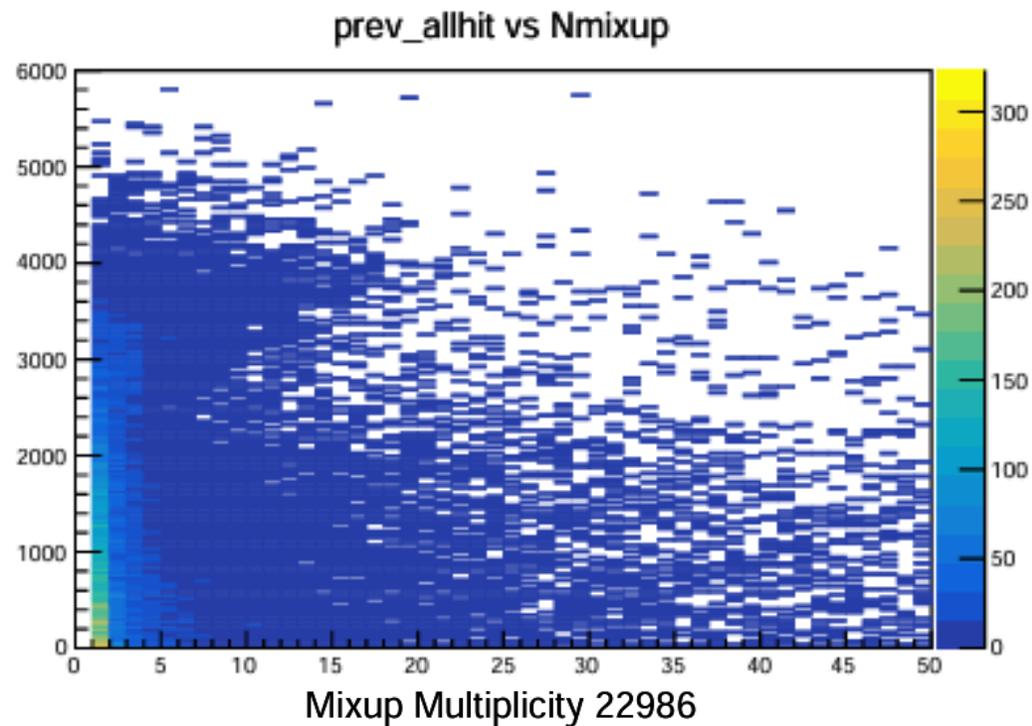
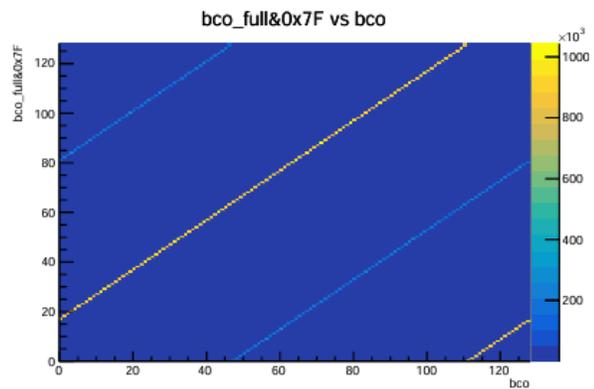
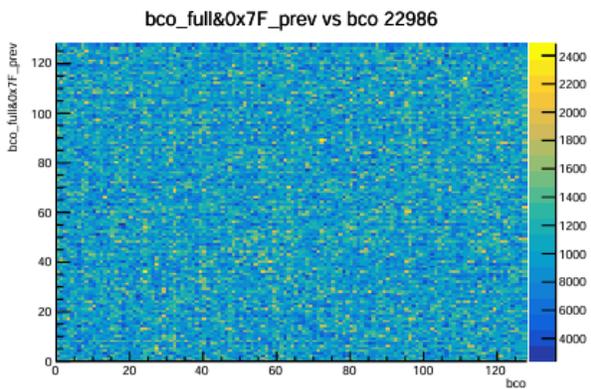
prev_allhit vs Nmixup



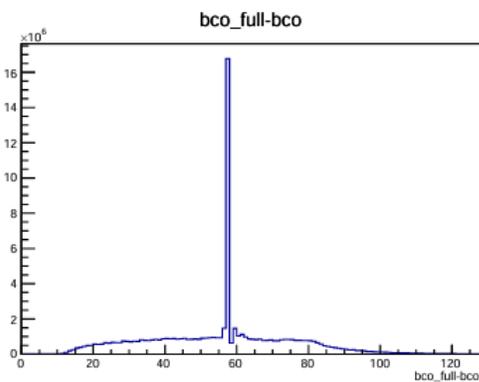
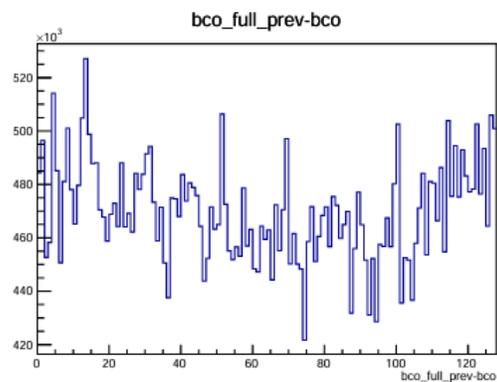
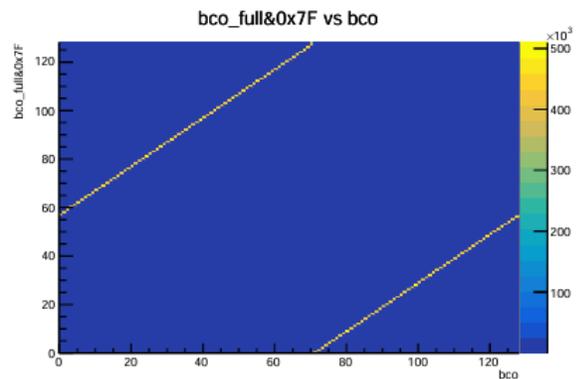
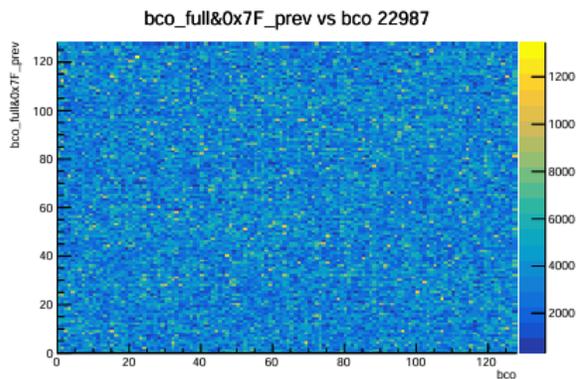
Mixup Multiplicity 22979



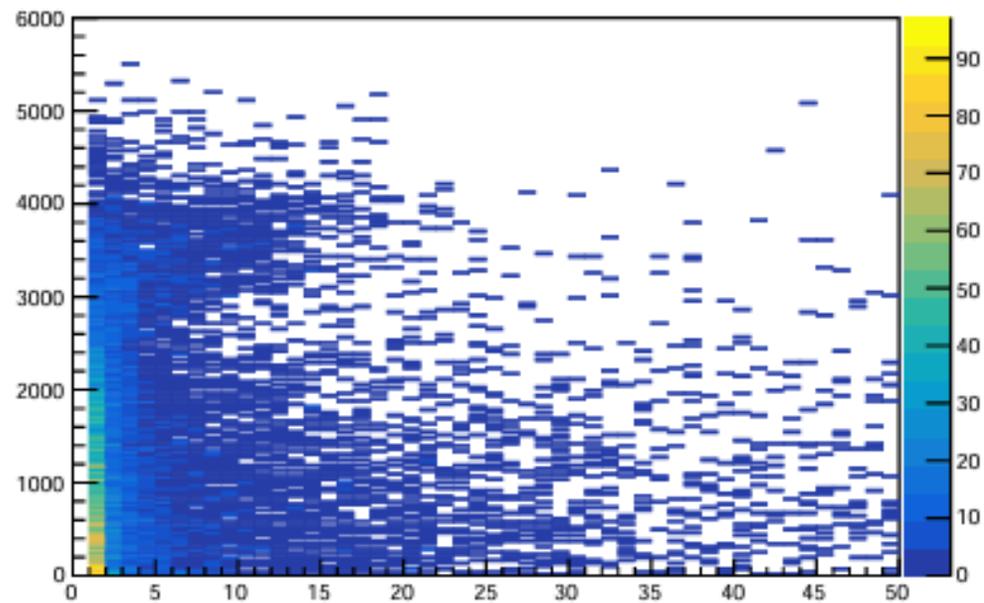
Run22986 intt3



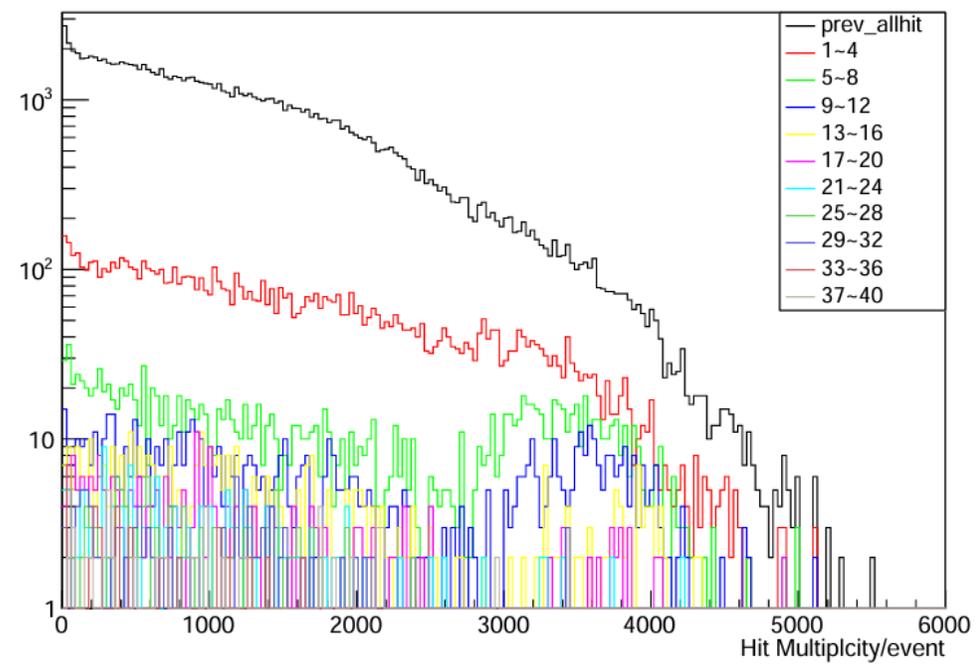
Run22987 intt3



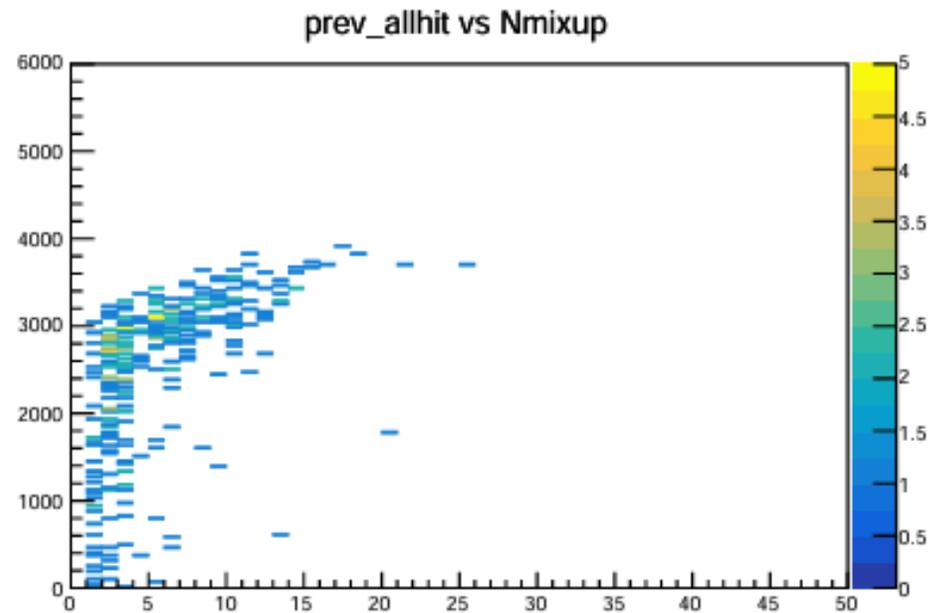
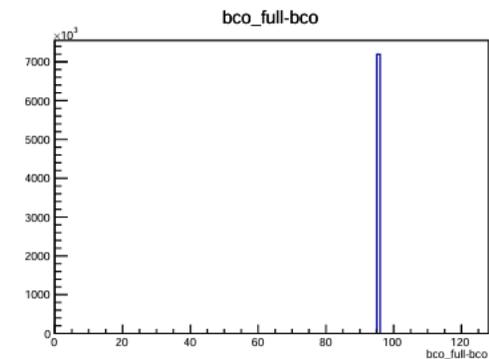
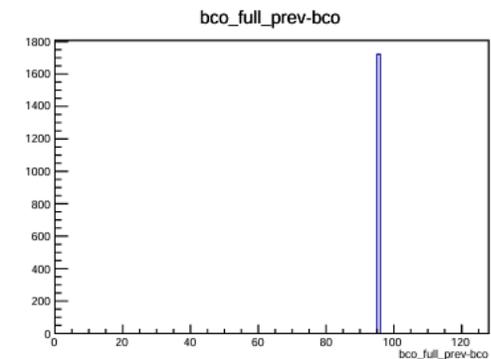
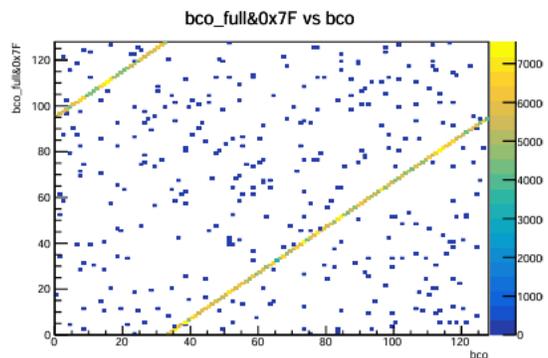
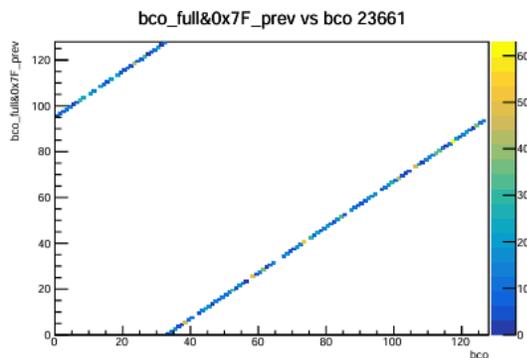
prev_allhit vs Nmixup



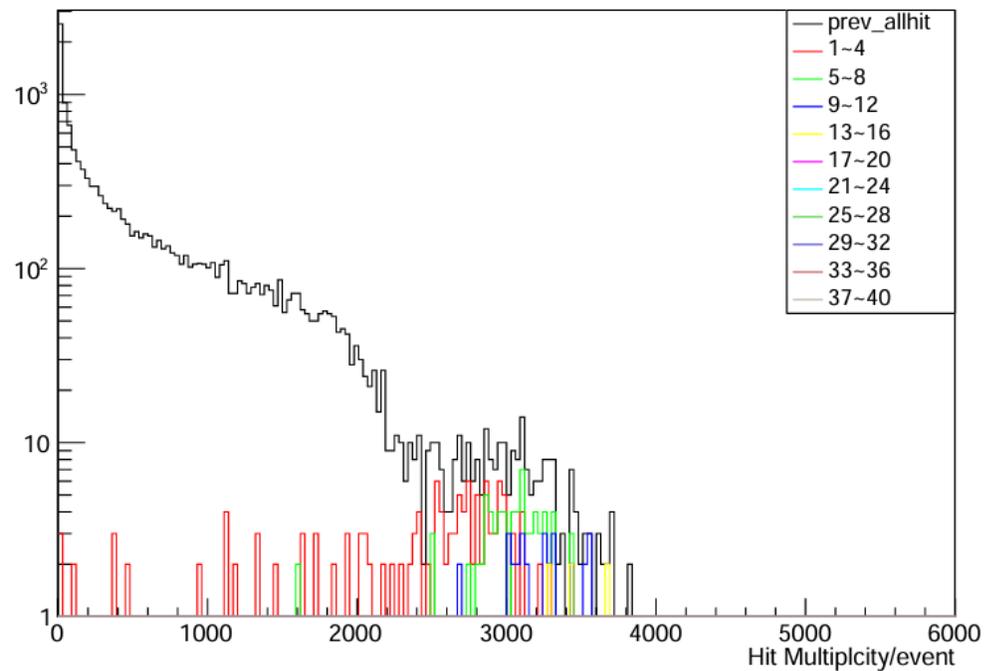
Mixup Multiplicity 22987



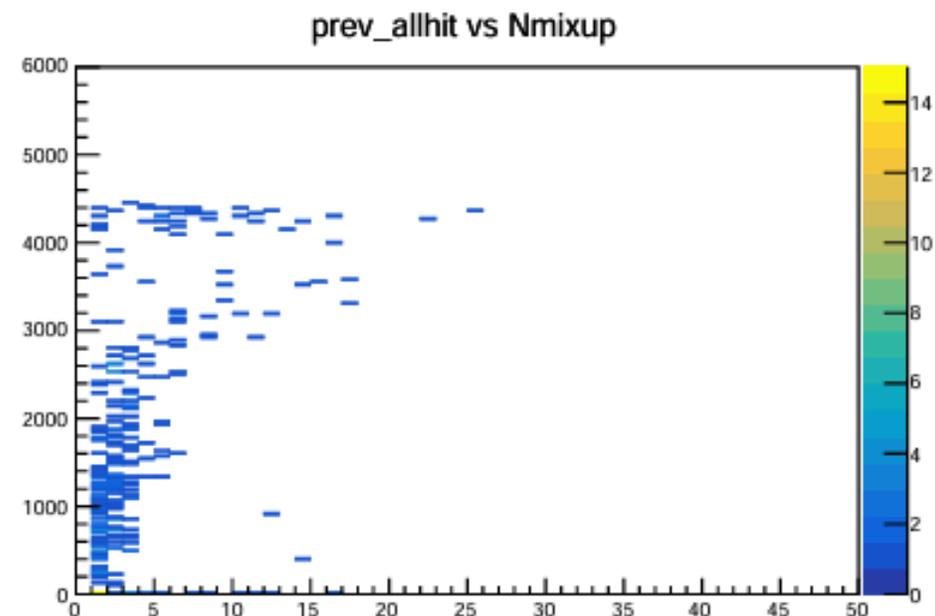
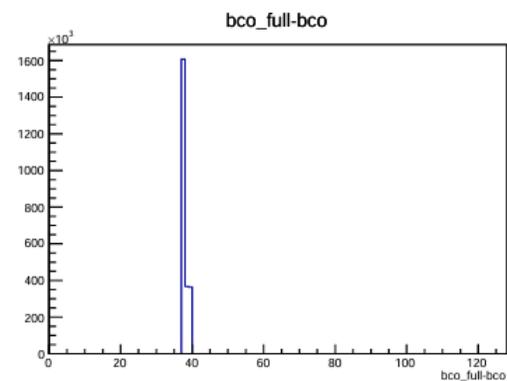
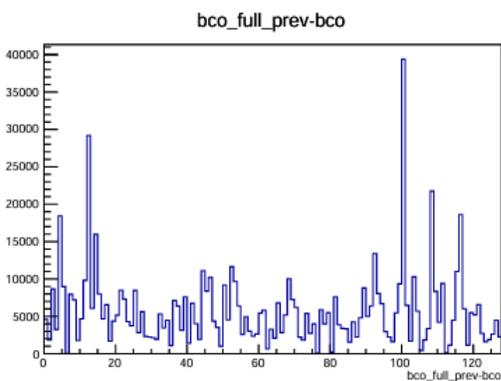
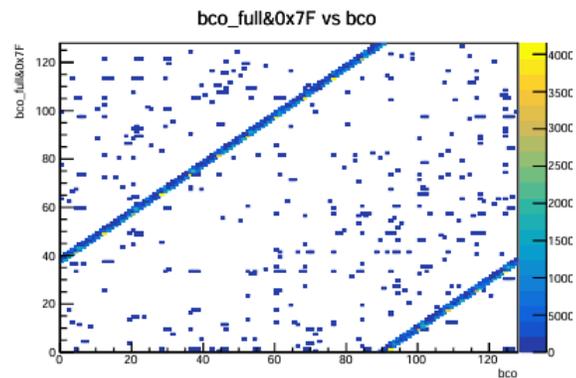
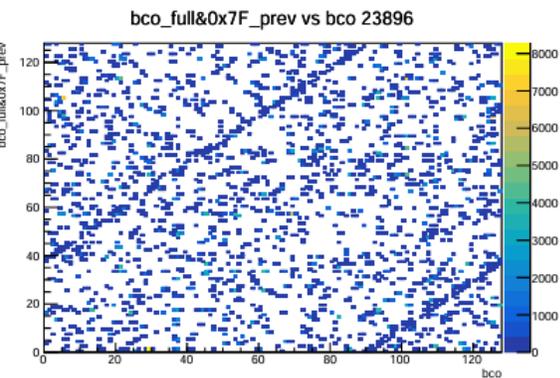
Run23661 intt3



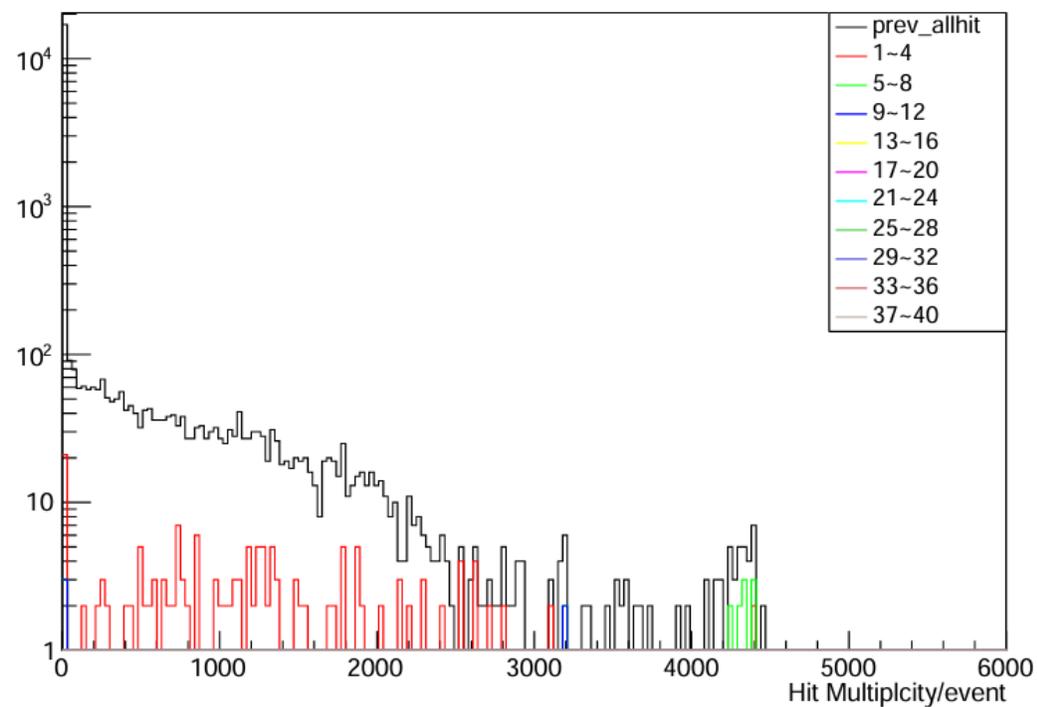
Mixup Multiplicity 23661



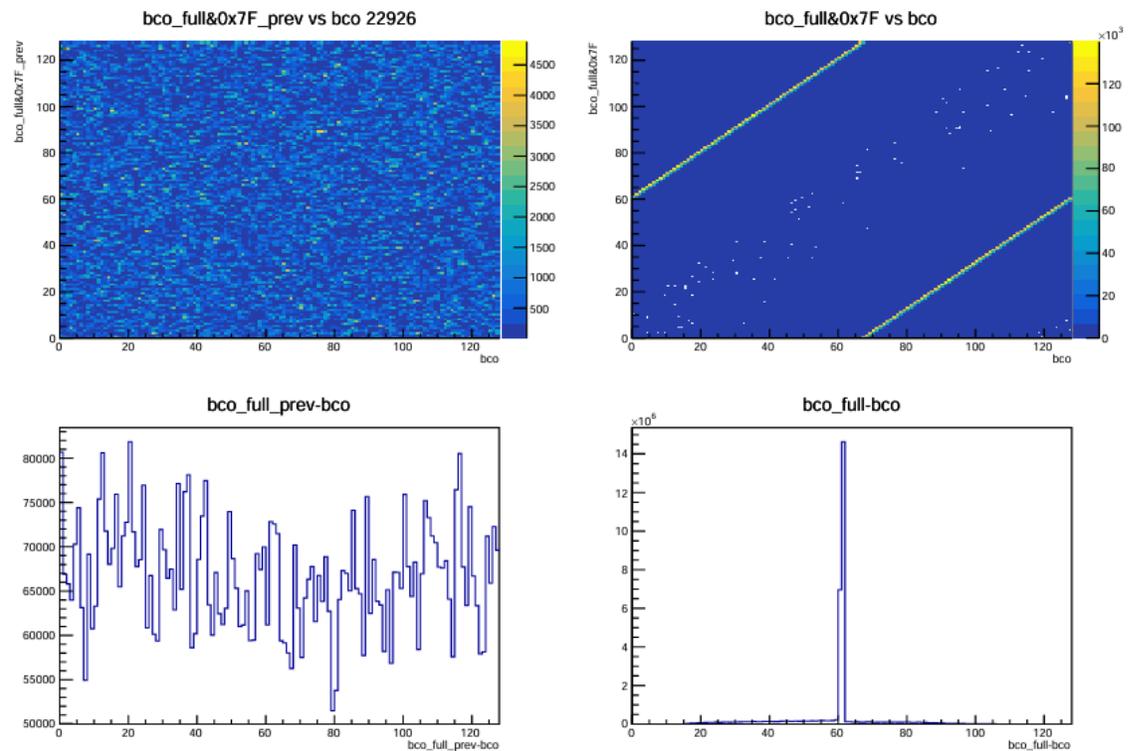
Run23896 intt3



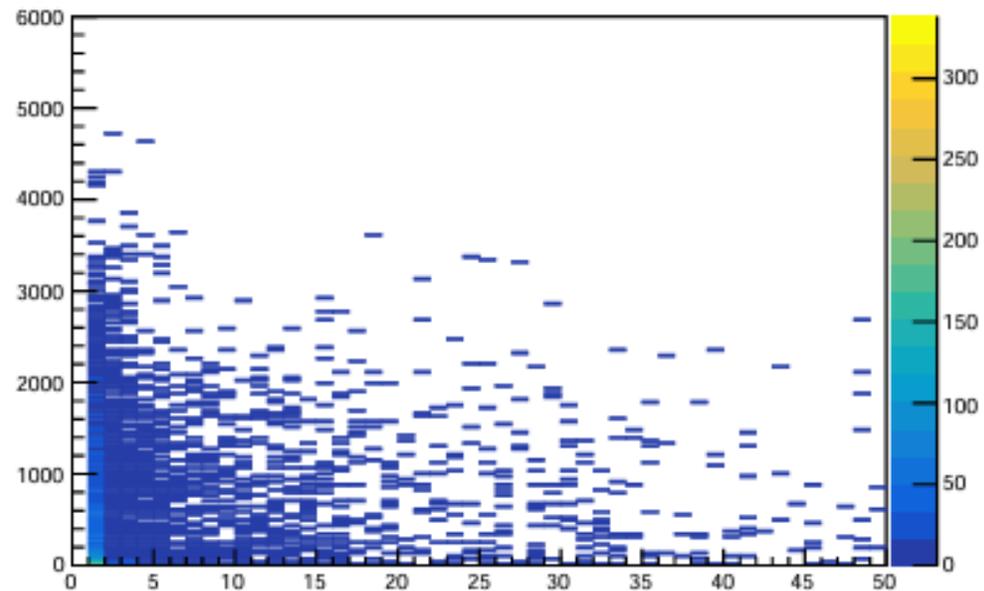
Mixup Multiplicity 23896



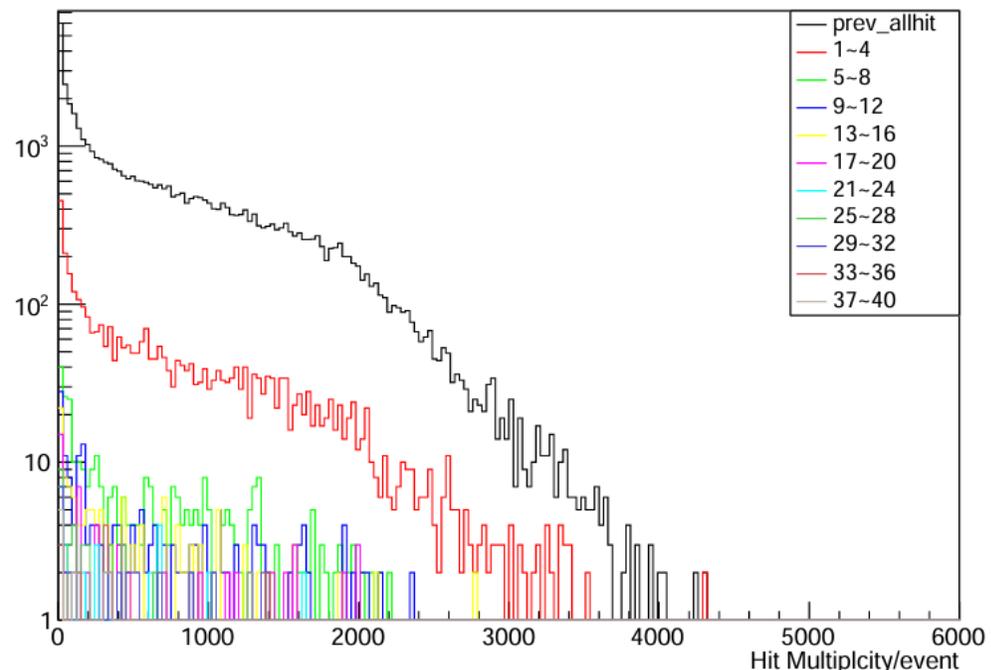
Run22926 intt4



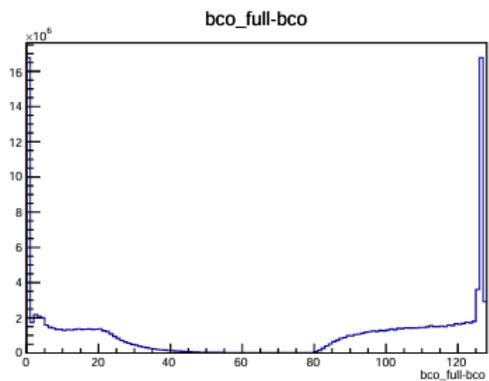
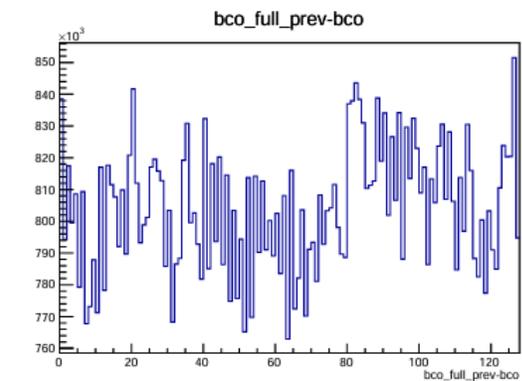
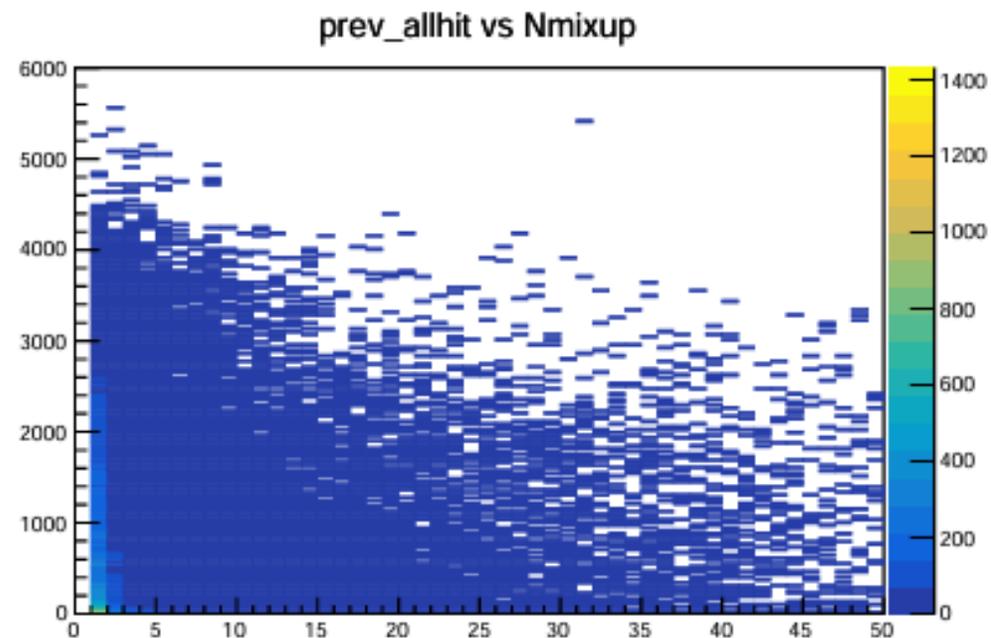
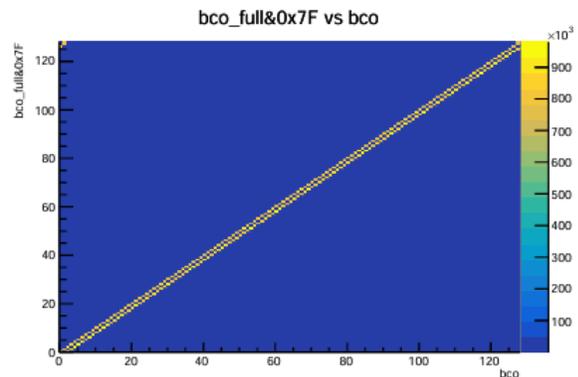
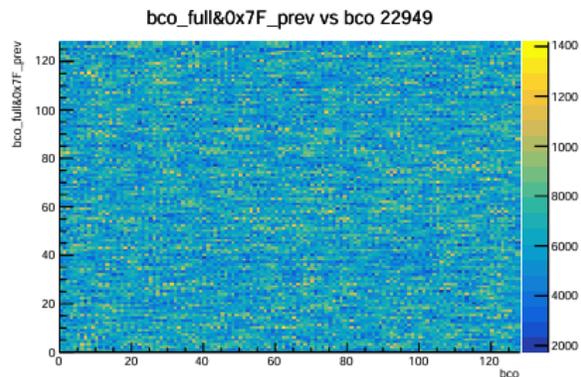
prev_allhit vs Nmixup



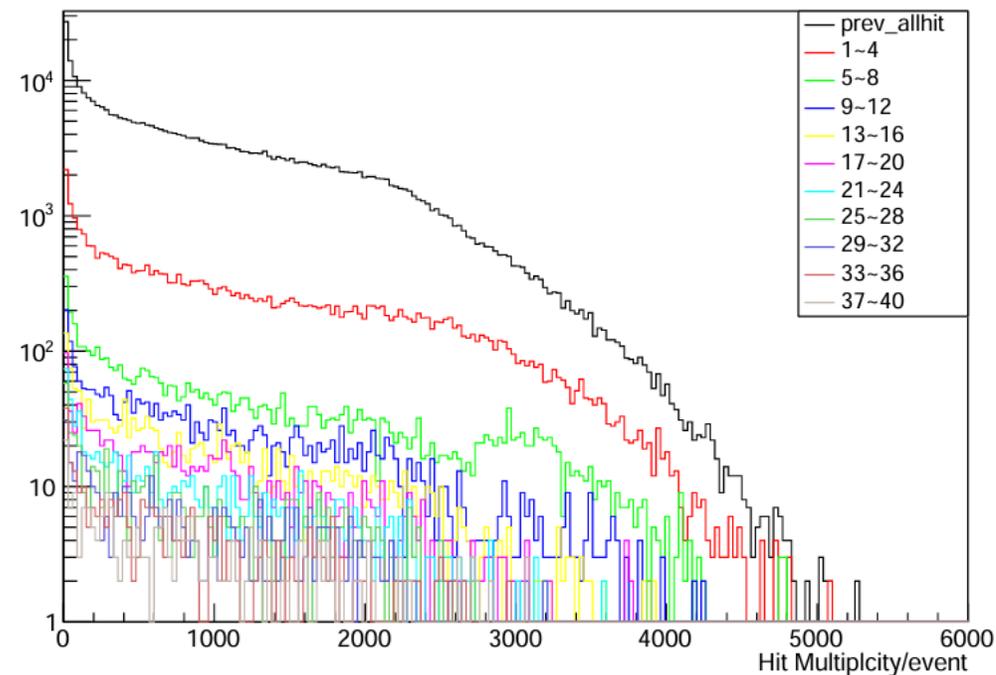
Mixup Multiplicity 22926



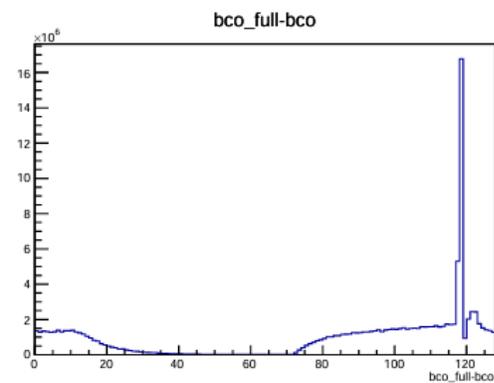
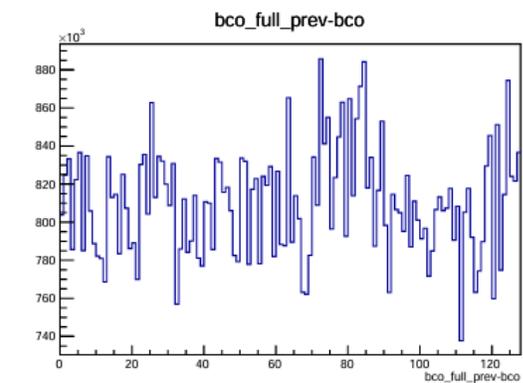
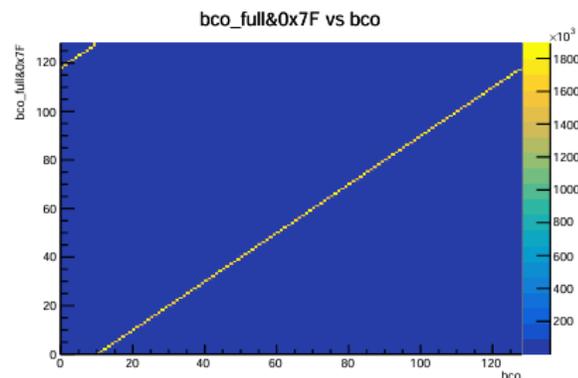
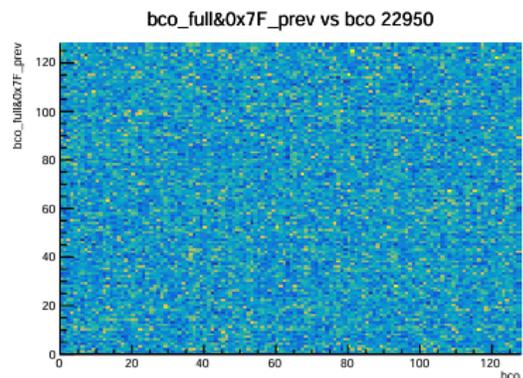
Run22949 intt4



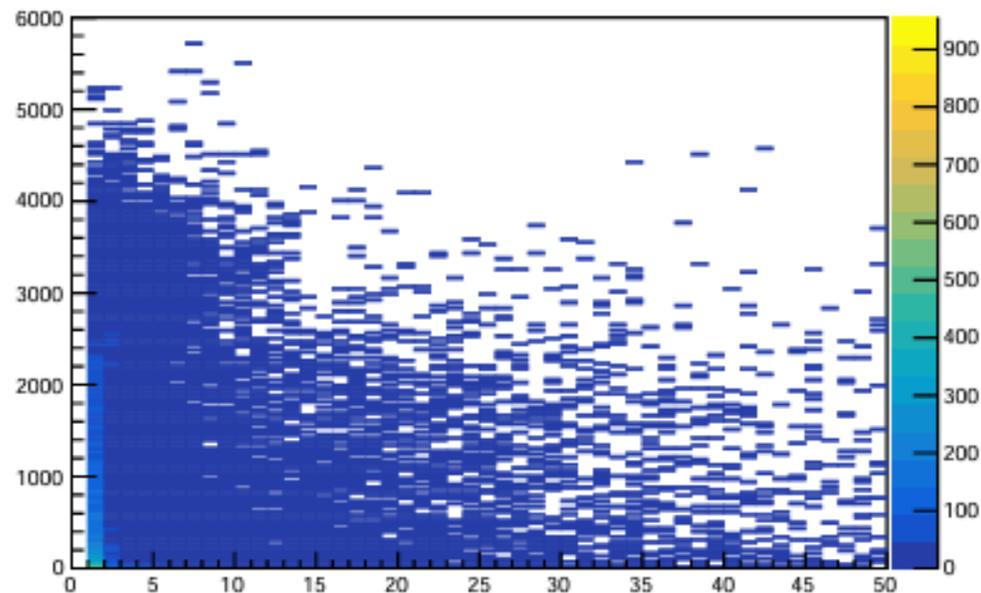
Mixup Multiplicity 22949



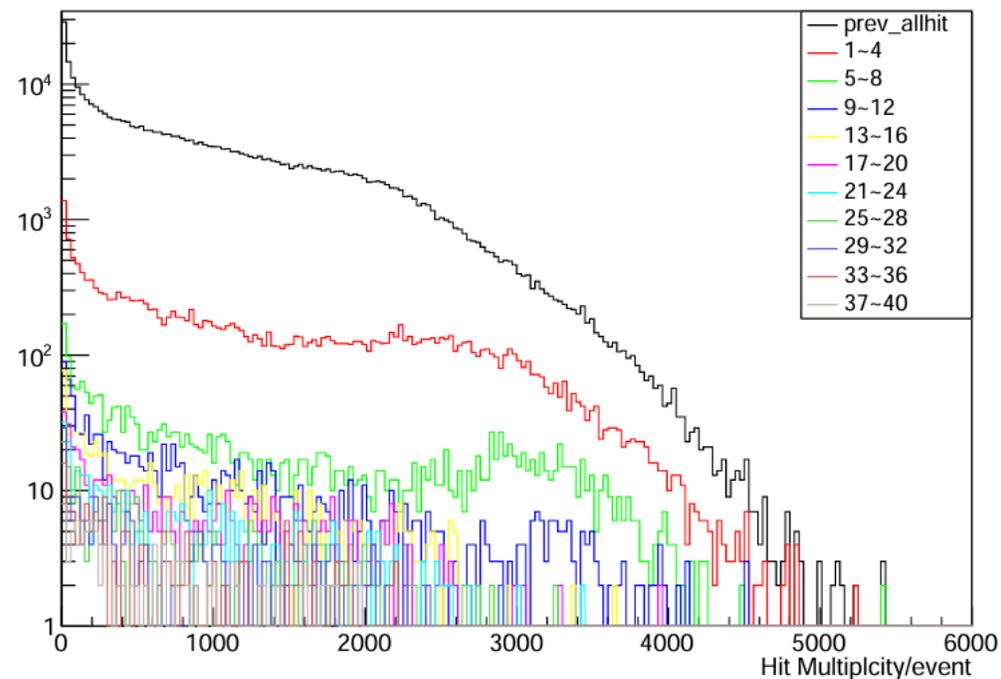
Run22950 intt4



prev_allhit vs Nmixup

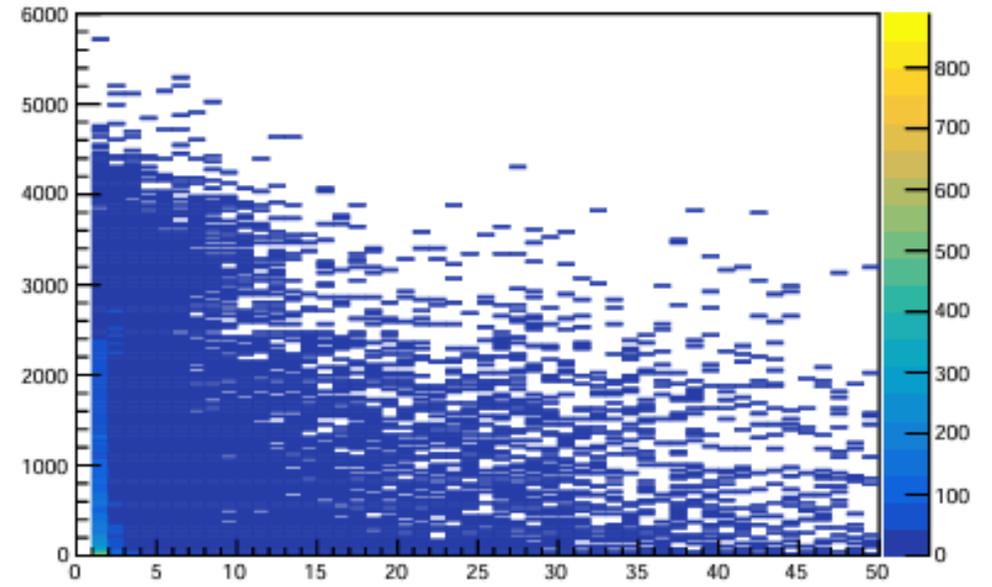


Mixup Multiplicity 22950

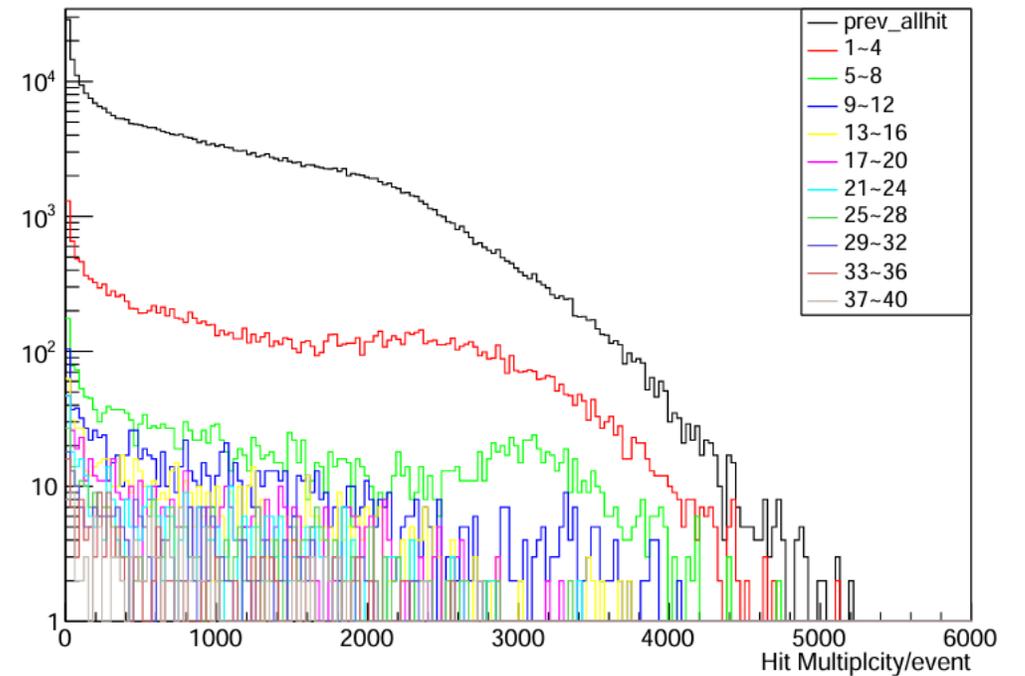


Run22951 inttt4

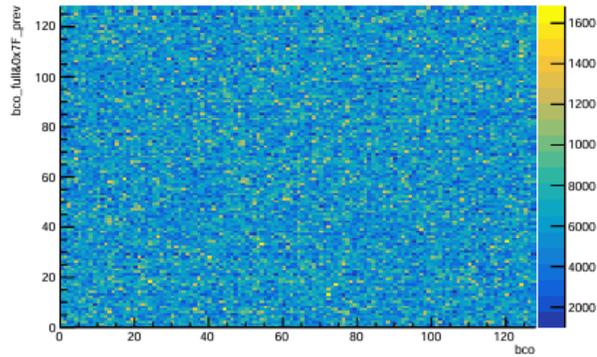
prev_allhit vs Nmixup



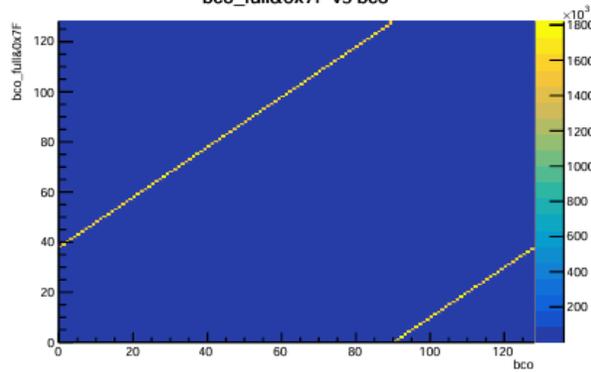
Mixup Multiplicity 22951



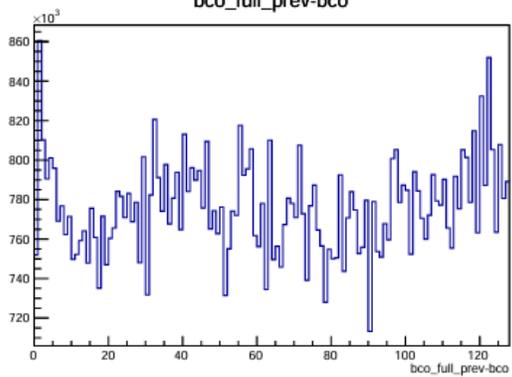
bco_full&0x7F_prev vs bco 22951



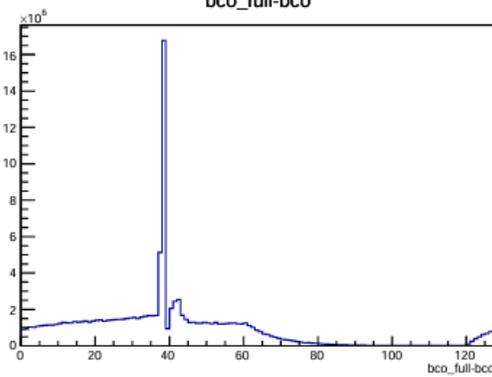
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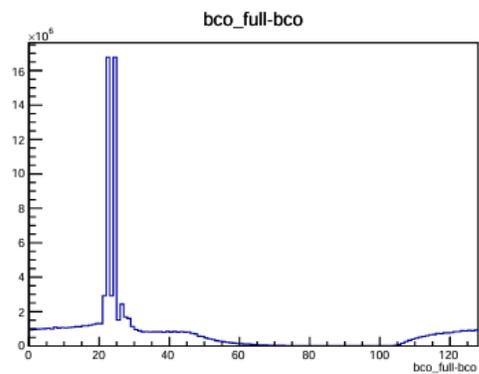
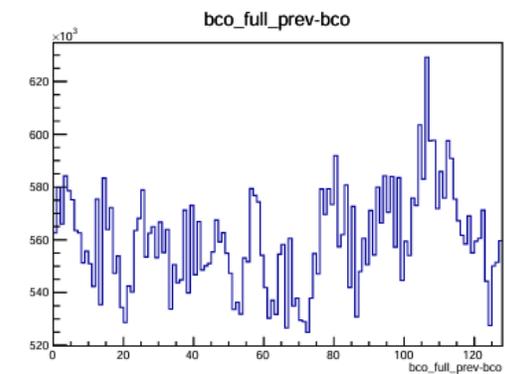
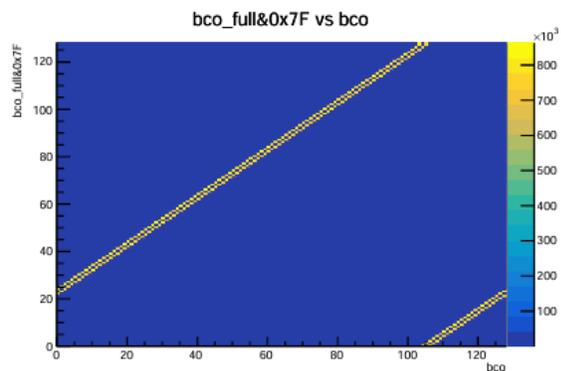
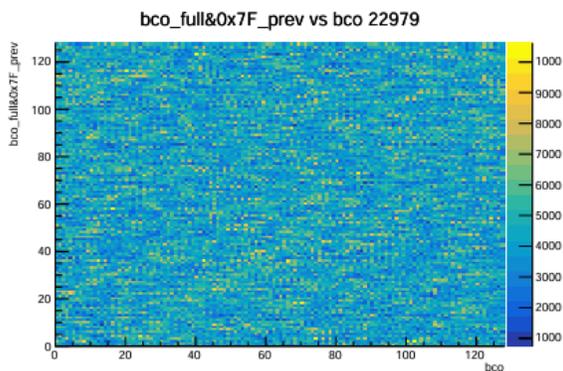
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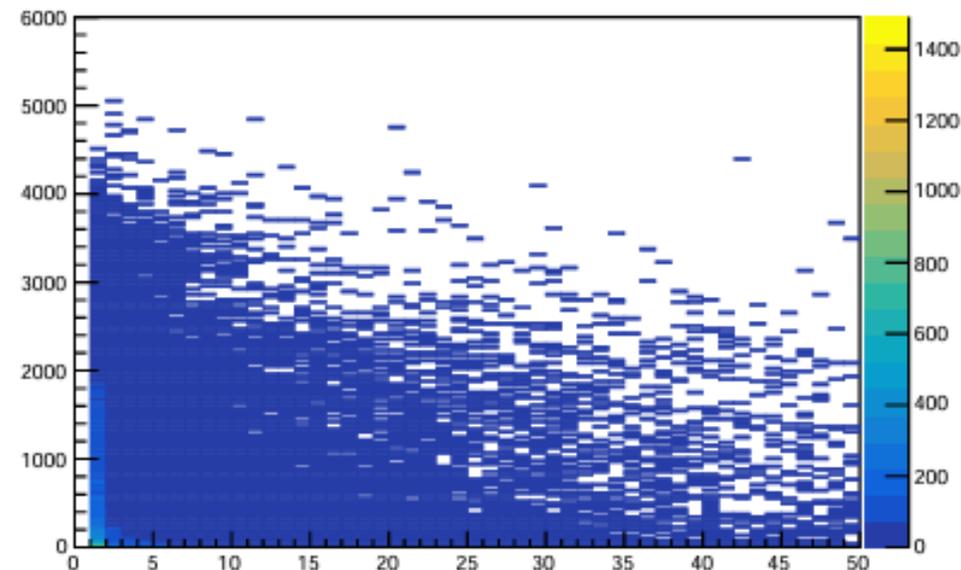
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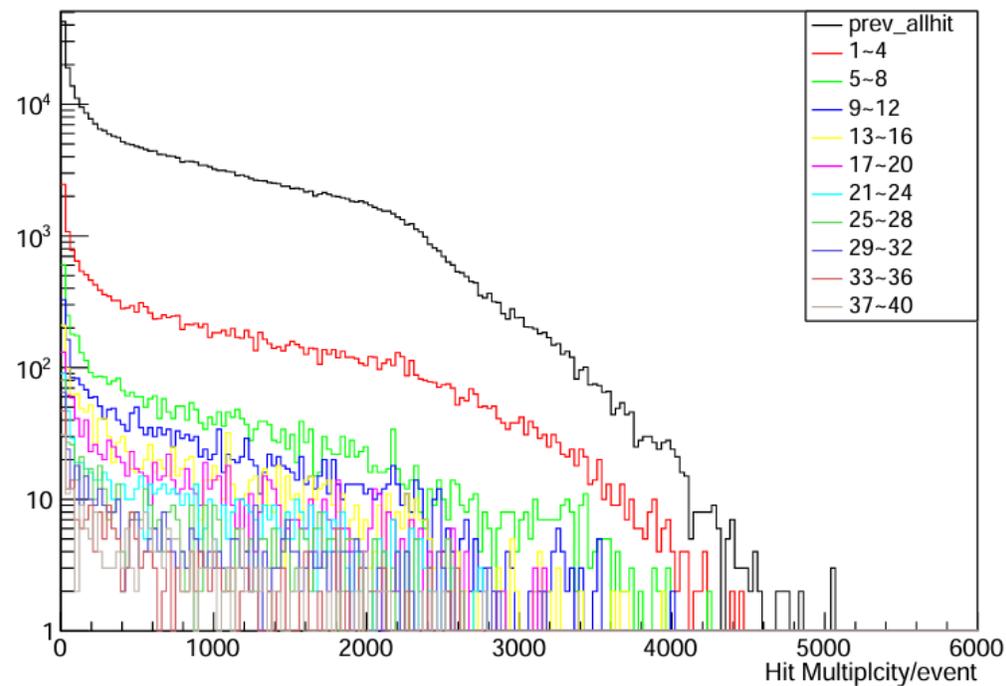
Run22979 intt4



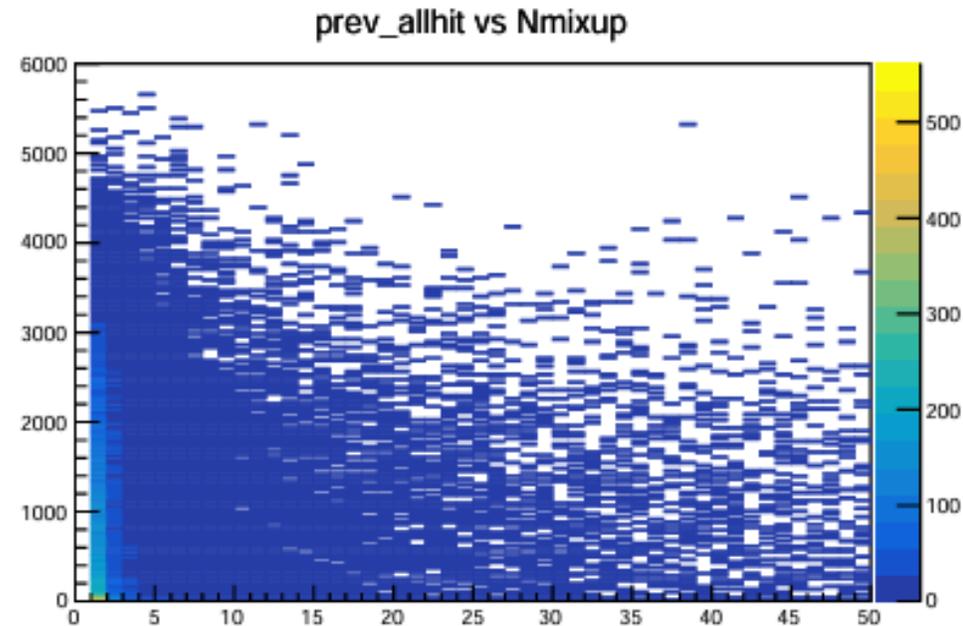
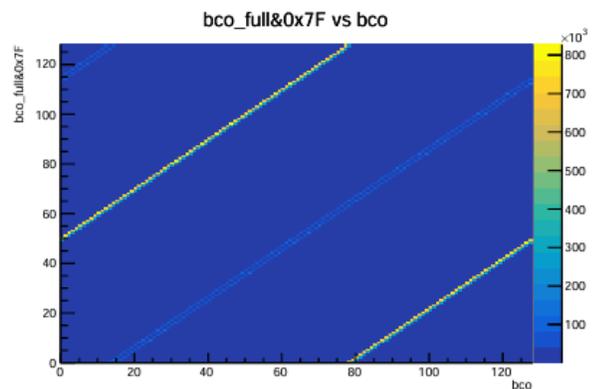
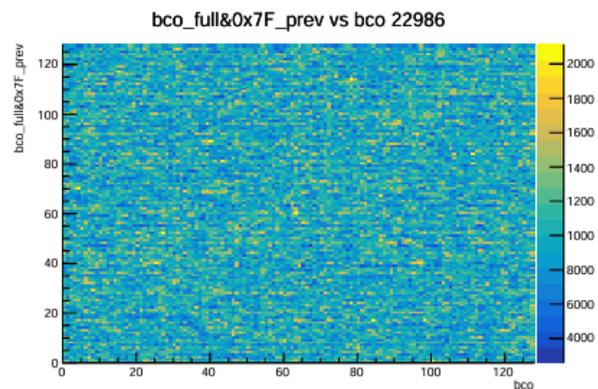
prev_allhit vs Nmixup



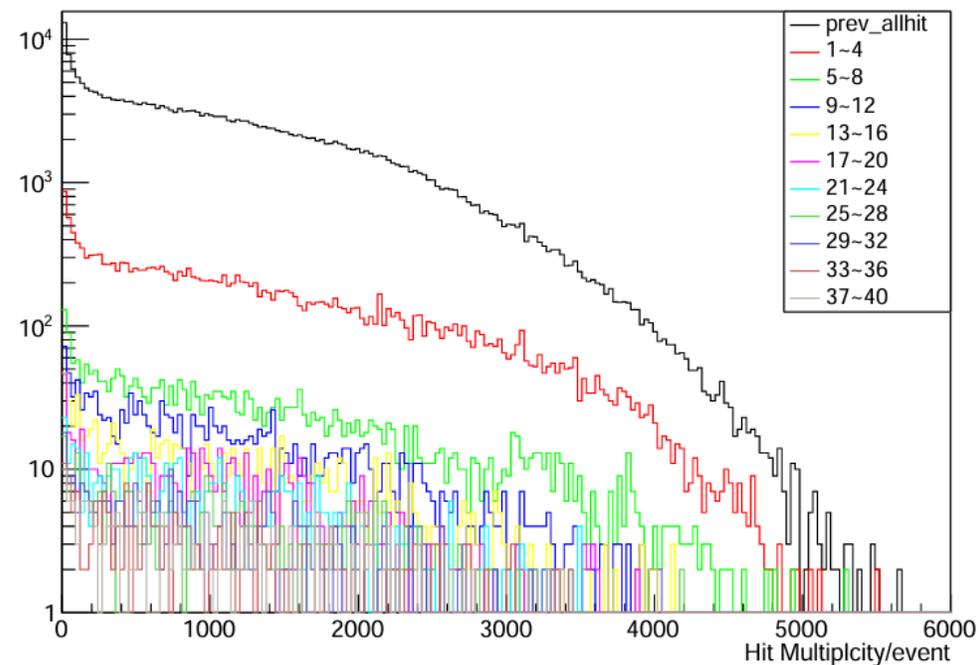
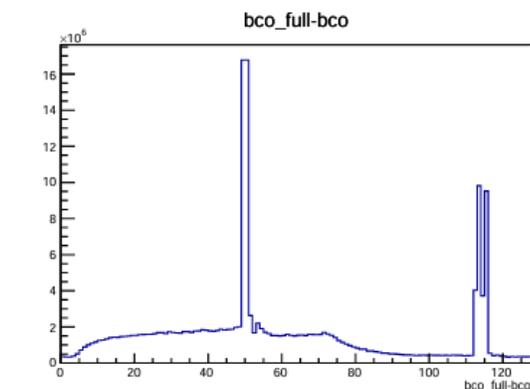
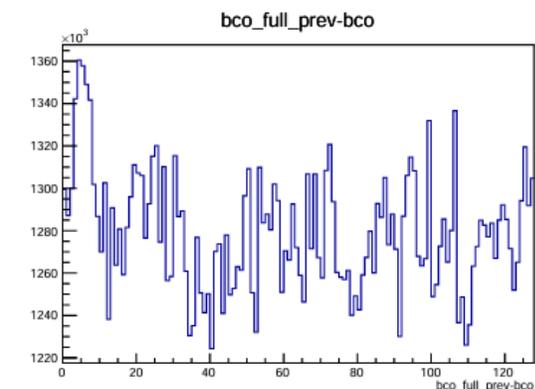
Mixup Multiplicity 22979



Run22986 intt4

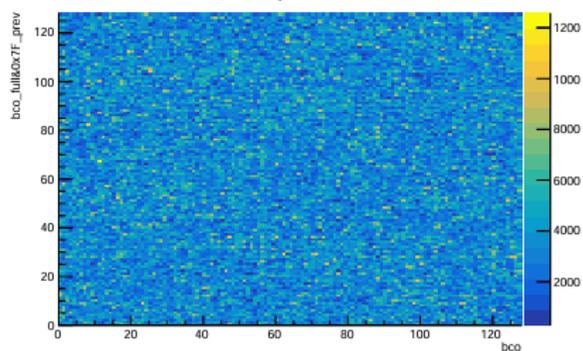


Mixup Multiplicity 22986

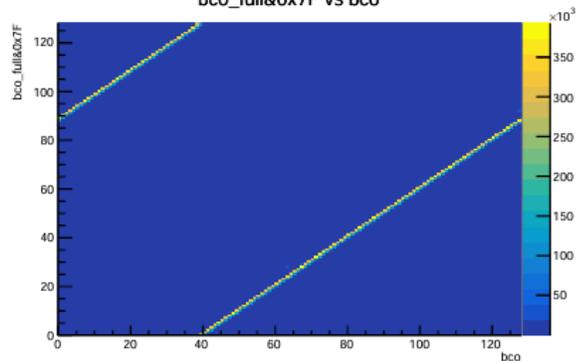


Run22987 intt4

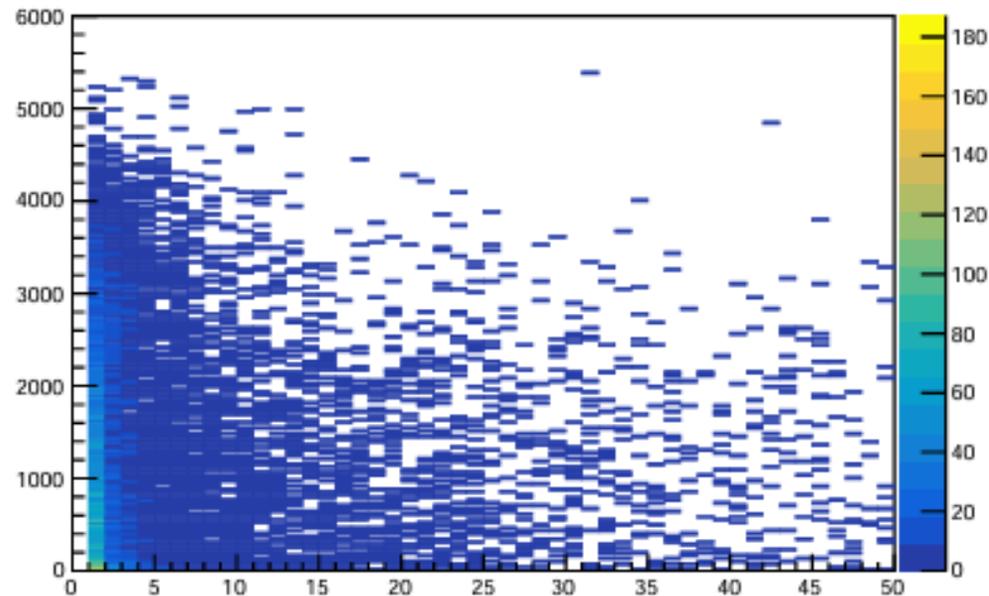
bco_full&0x7F_prev vs bco 22987



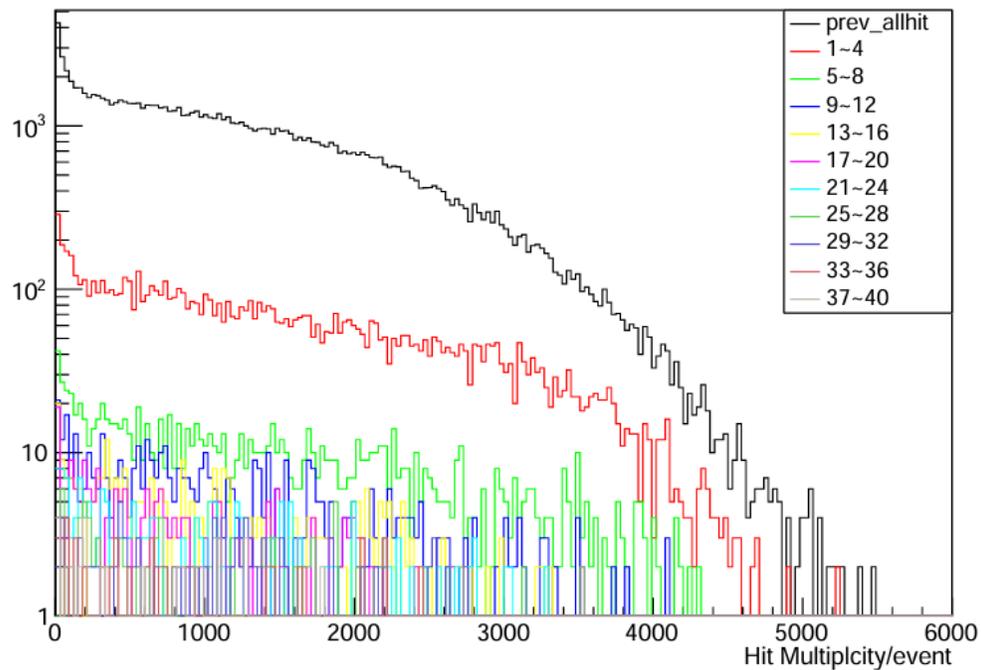
bco_full&0x7F vs bco



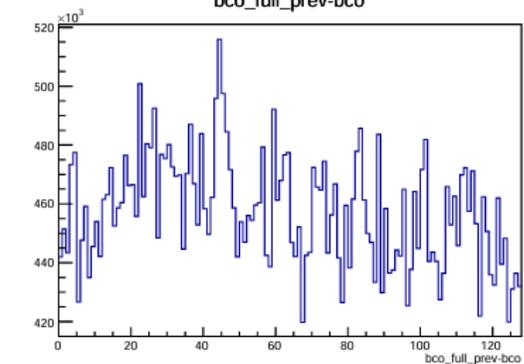
prev_allhit vs Nmixup



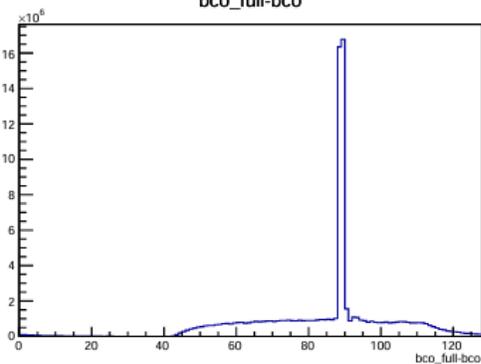
Mixup Multiplicity 22987



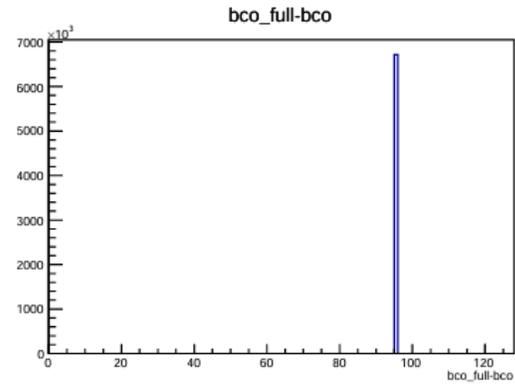
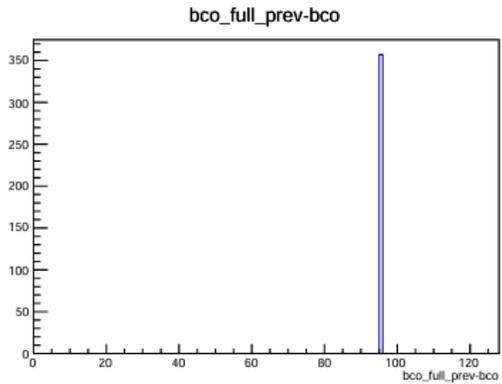
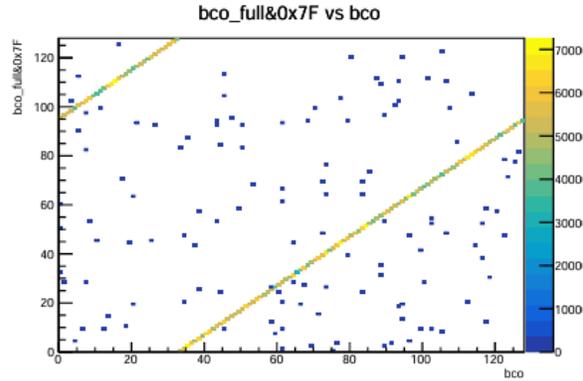
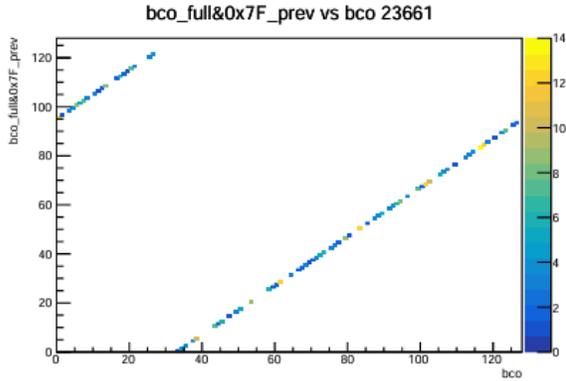
bco_full_prev-bco



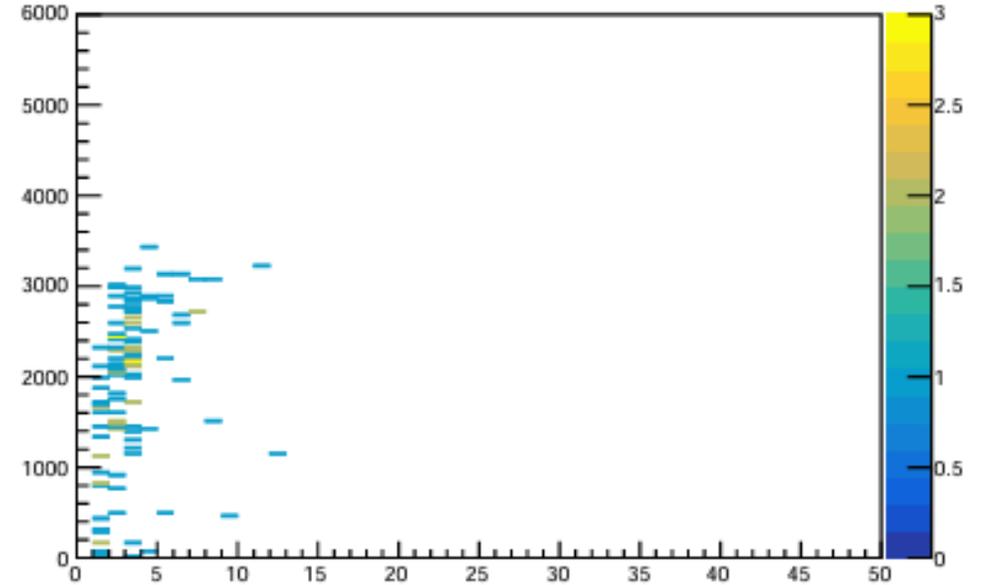
bco_full-bco



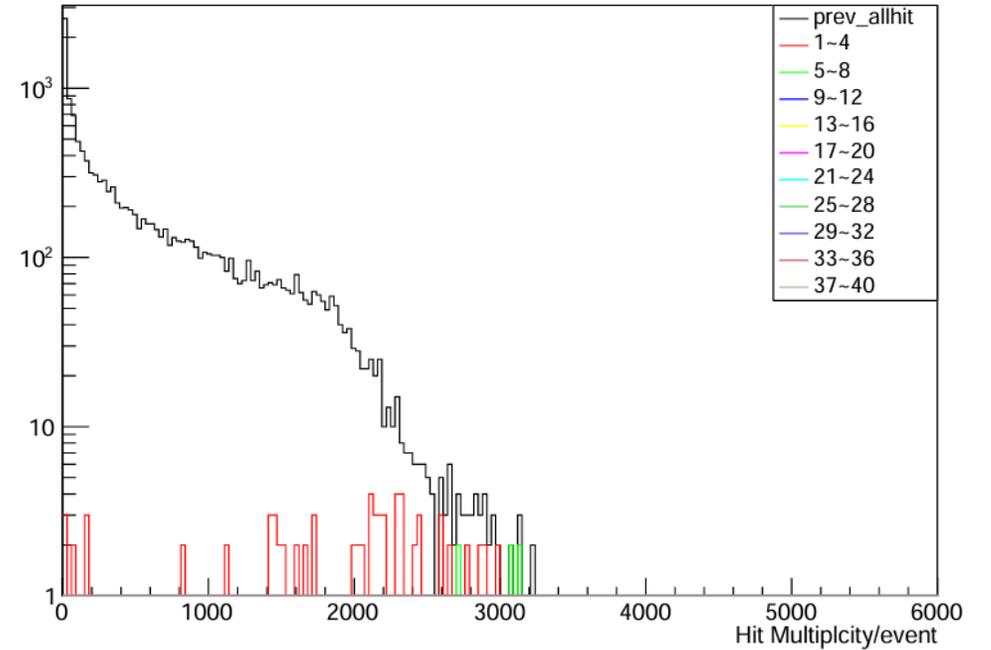
Run23661 intt4



prev_allhit vs Nmixup

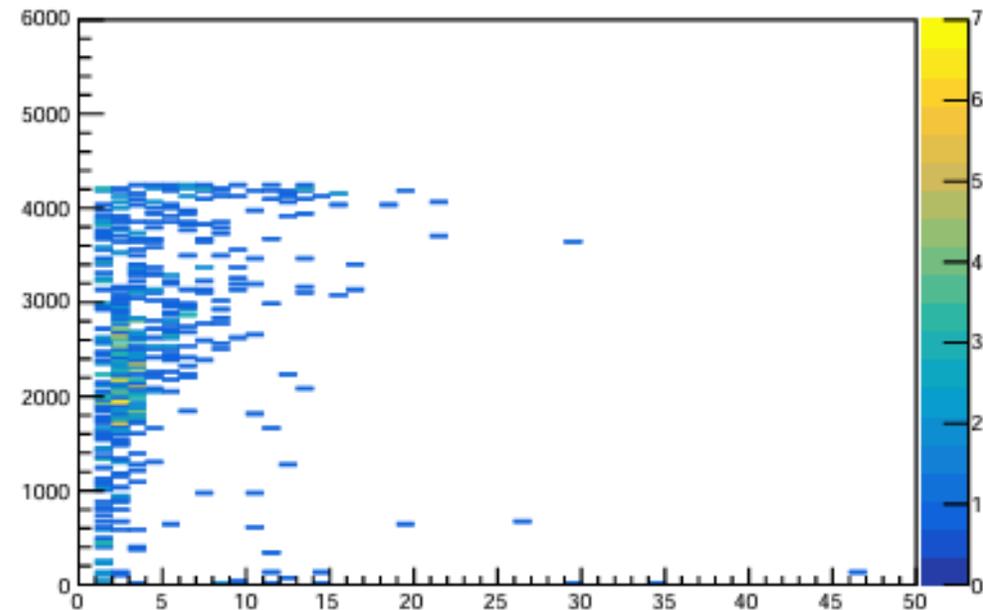


Mixup Multiplicity 23661

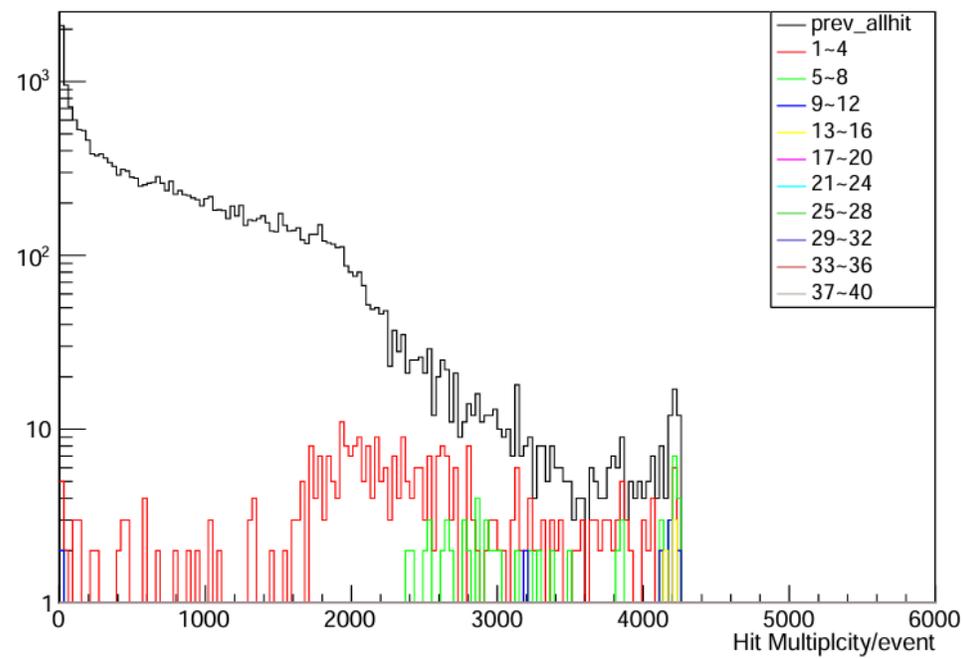


Run23896 intt4

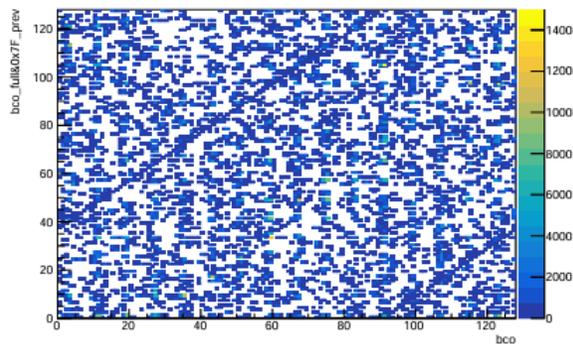
prev_allhit vs Nmixup



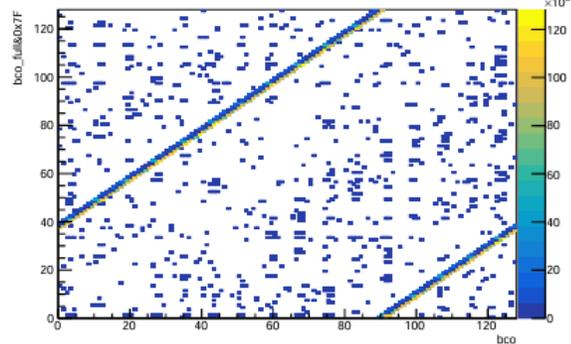
Mixup Multiplicity 23896



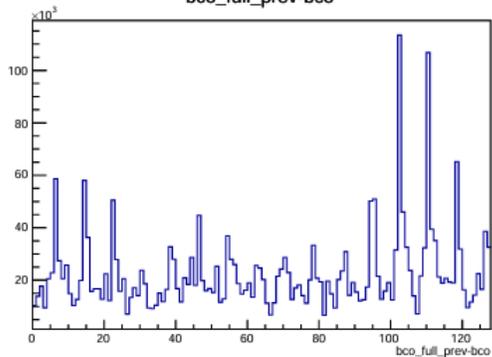
bco_full&0x7F_prev vs bco 23896



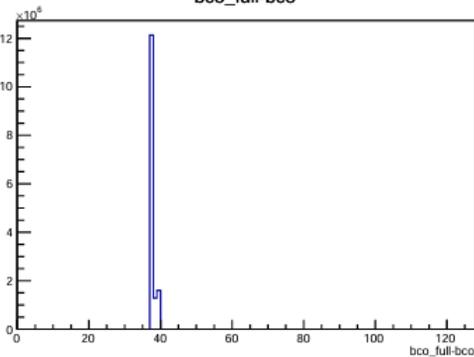
bco_full&0x7F vs bco



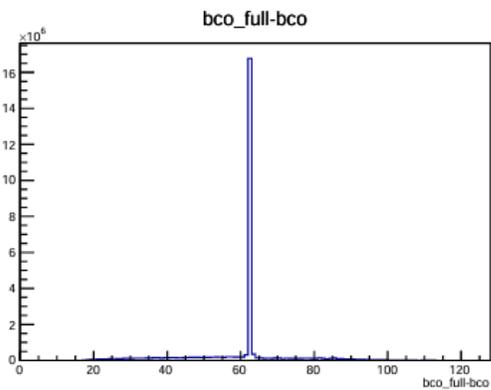
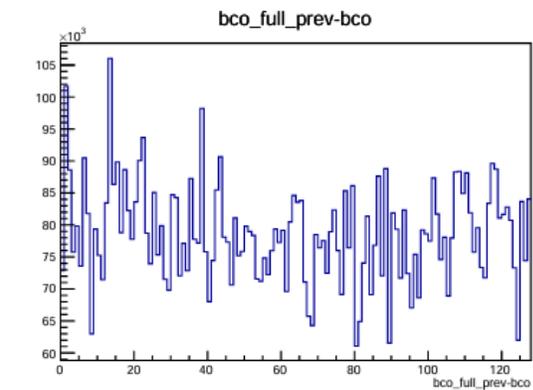
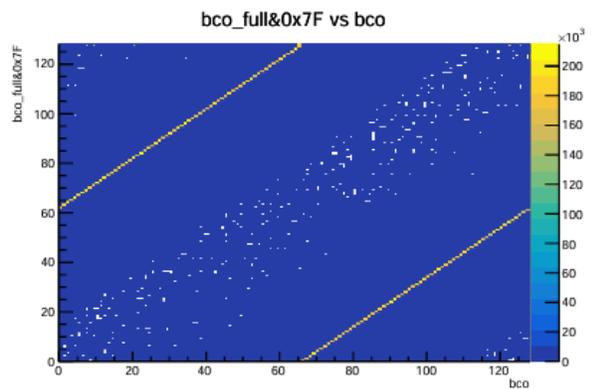
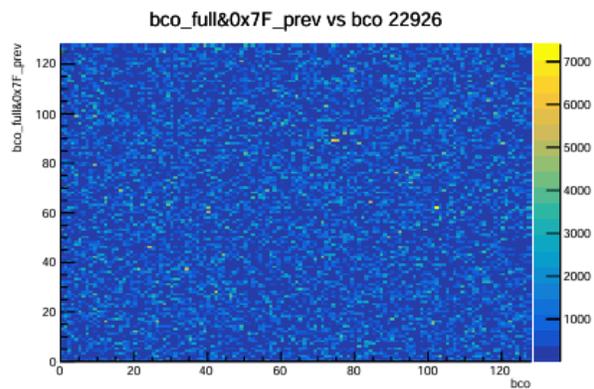
bco_full_prev-bco



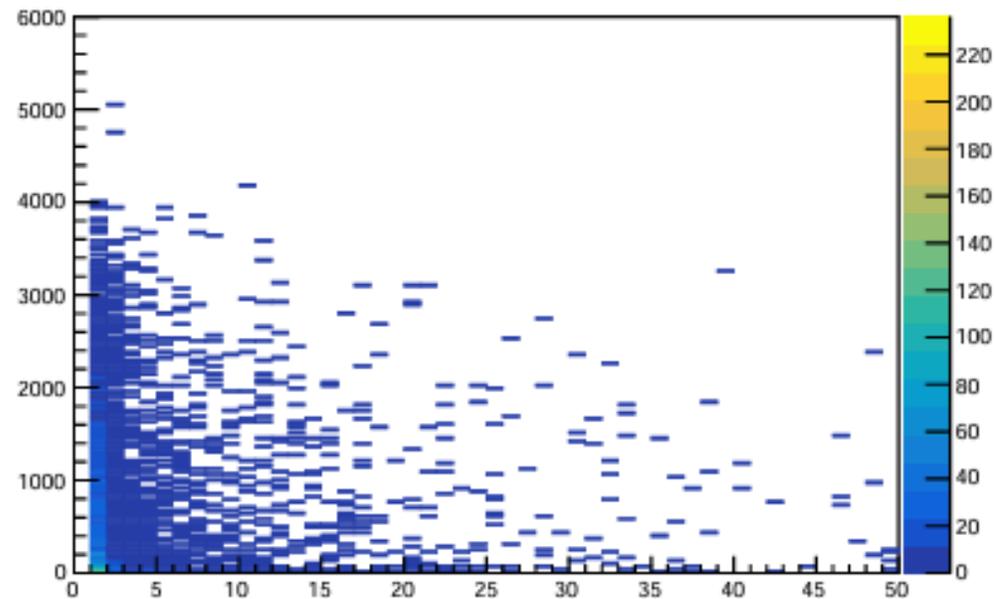
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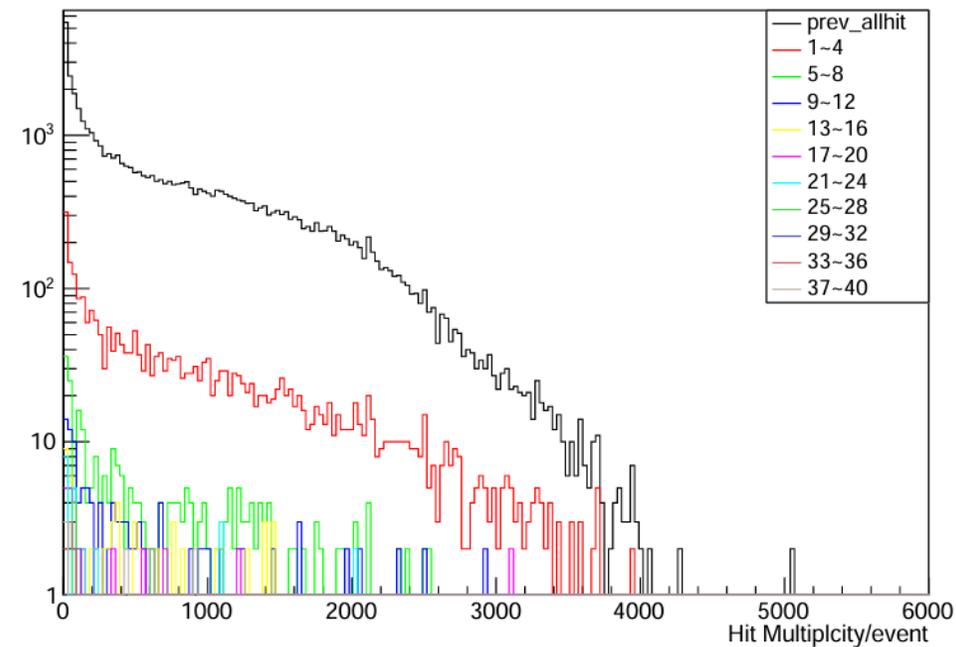
Run22926 intt5



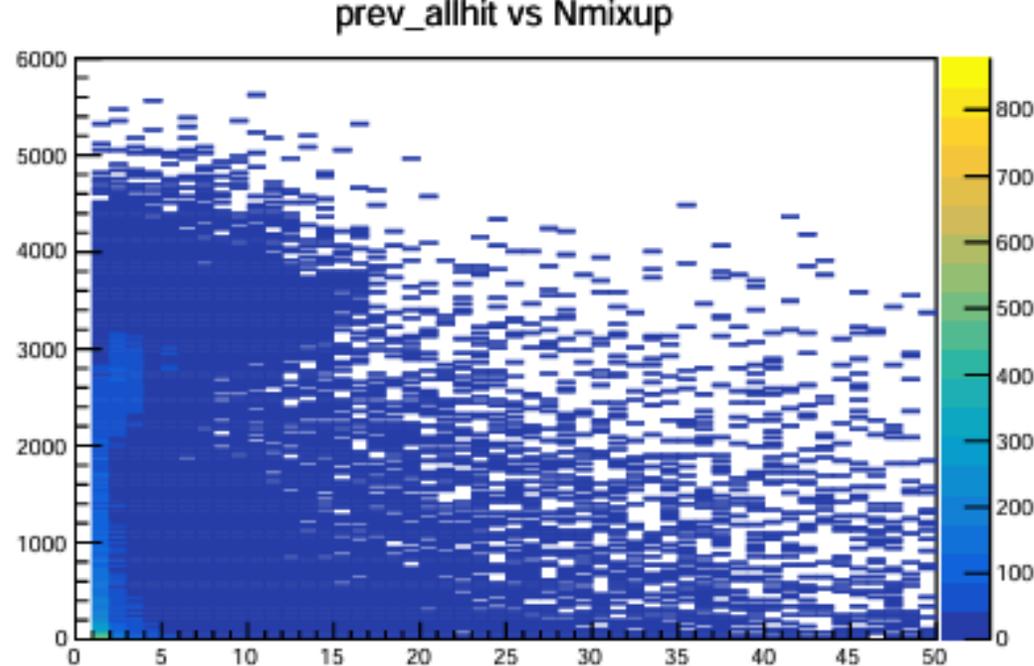
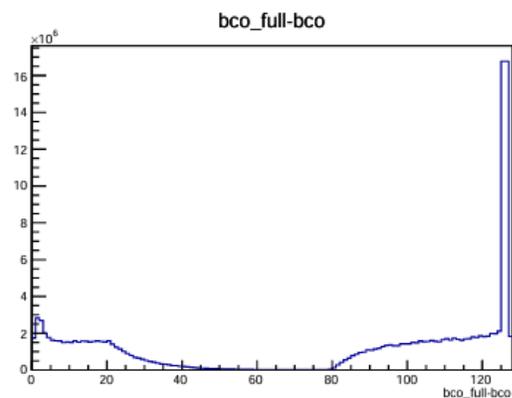
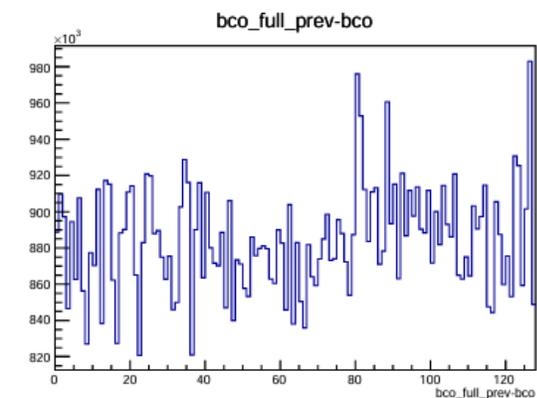
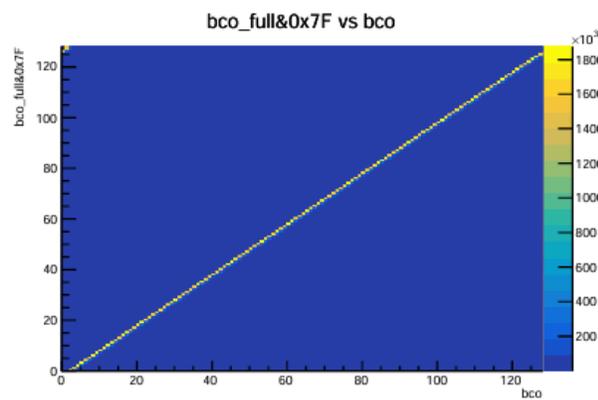
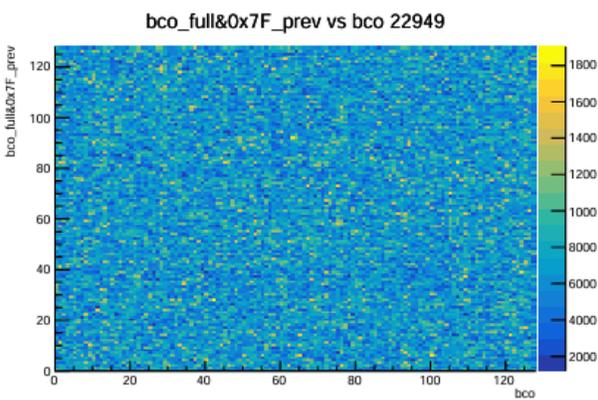
prev_allhit vs Nmixup



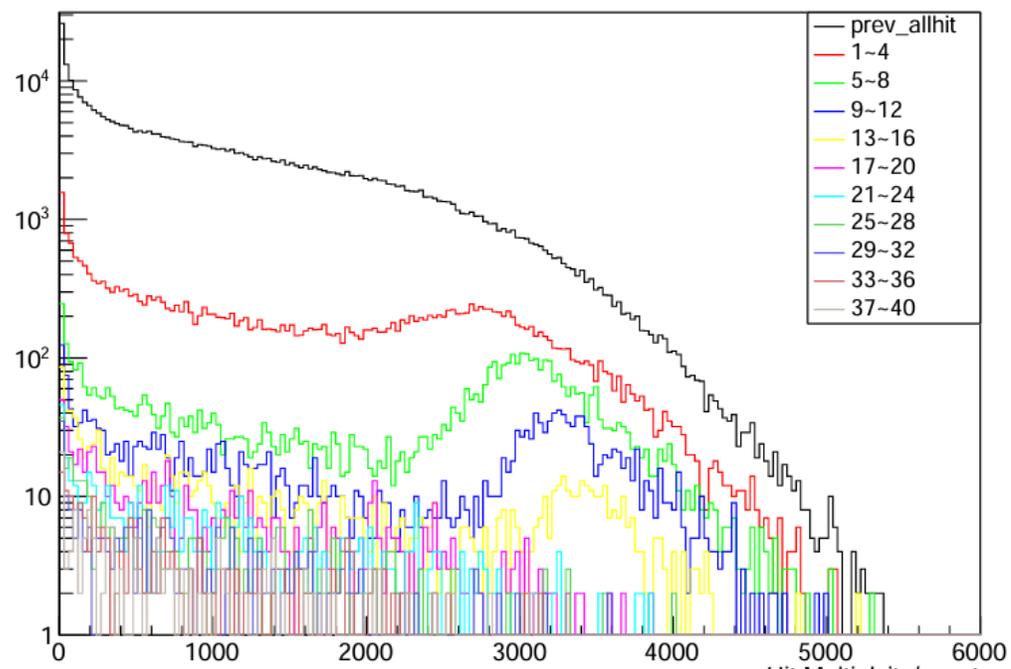
Mixup Multiplicity 22926



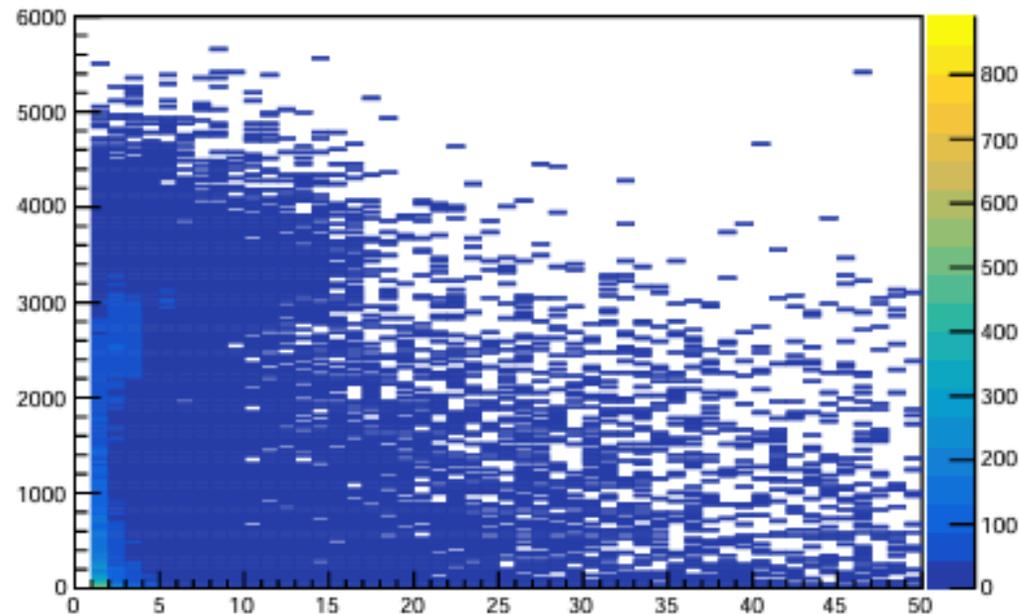
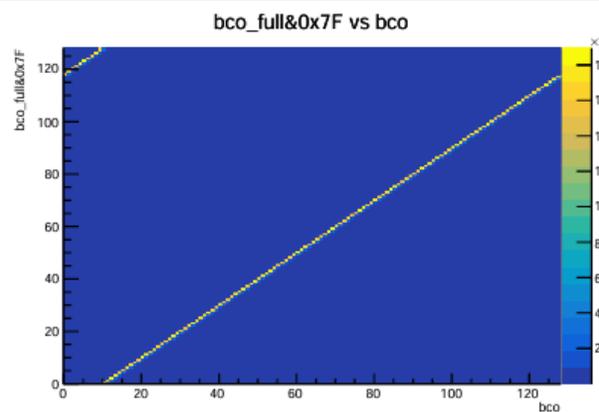
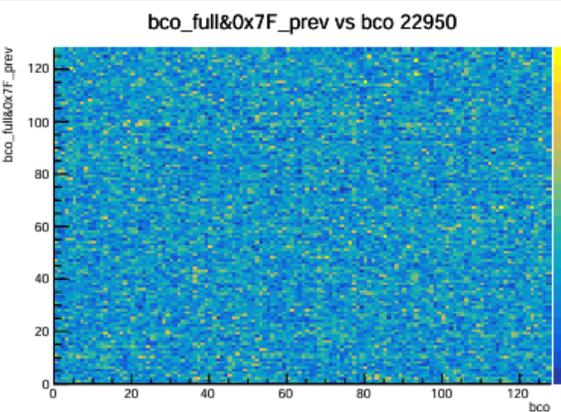
Run22949 intt5



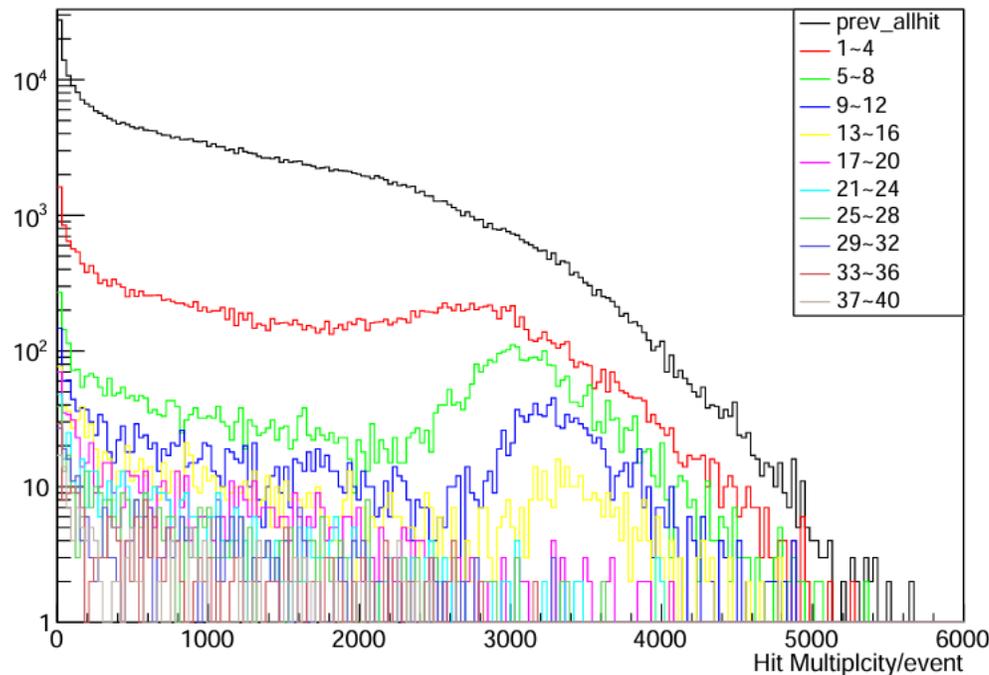
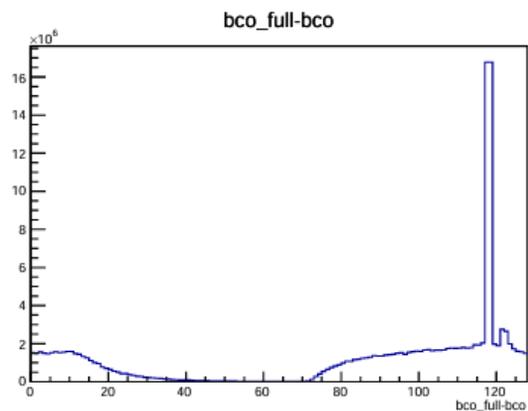
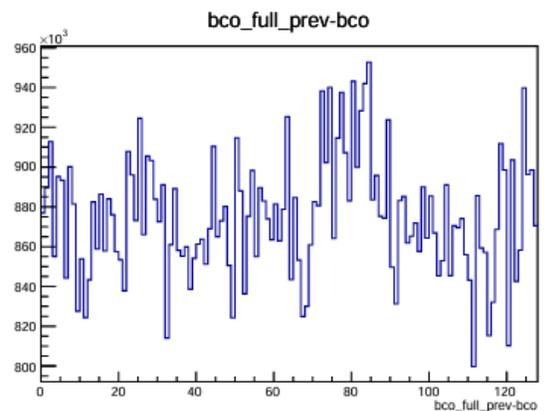
Mixup Multiplicity 22949



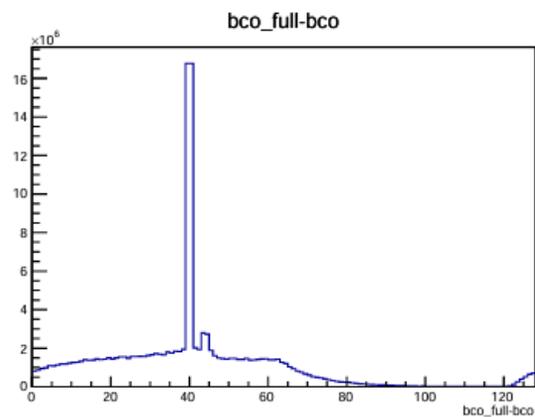
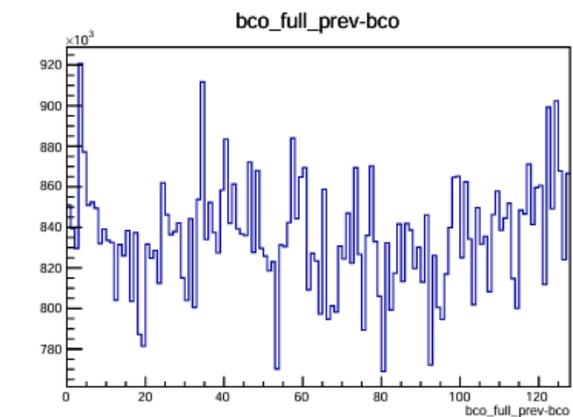
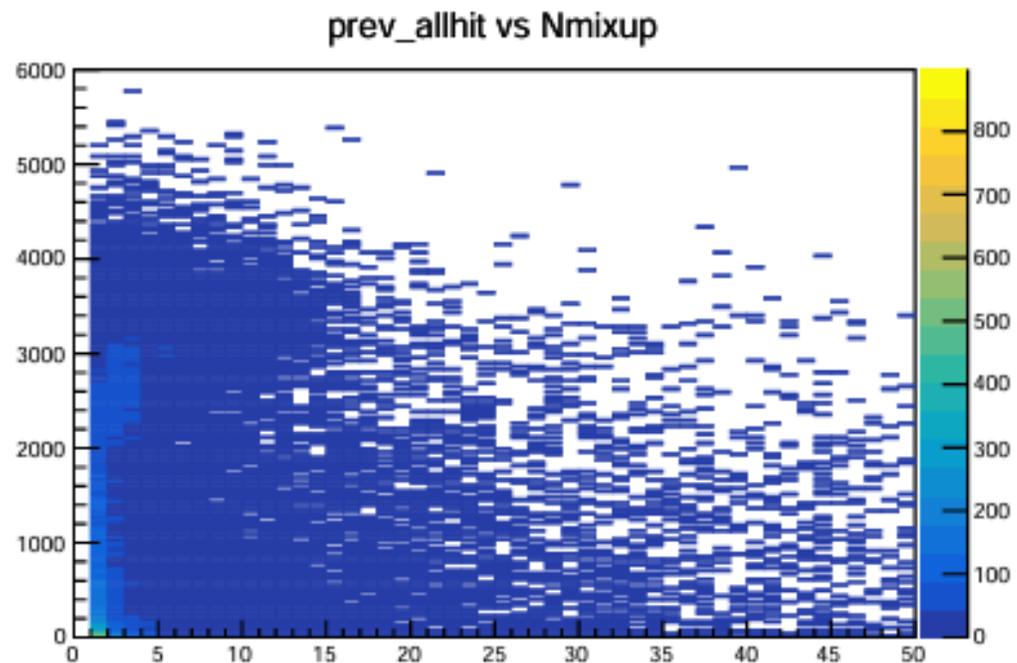
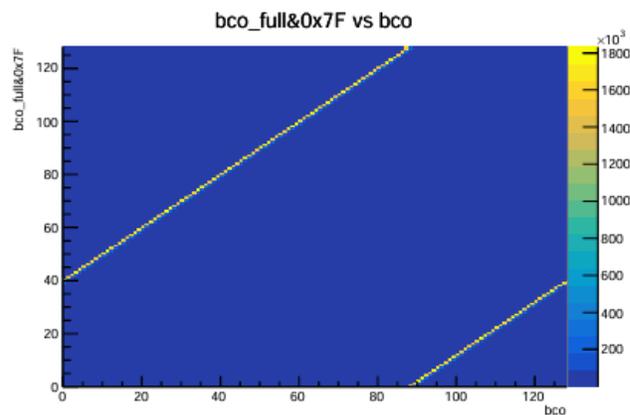
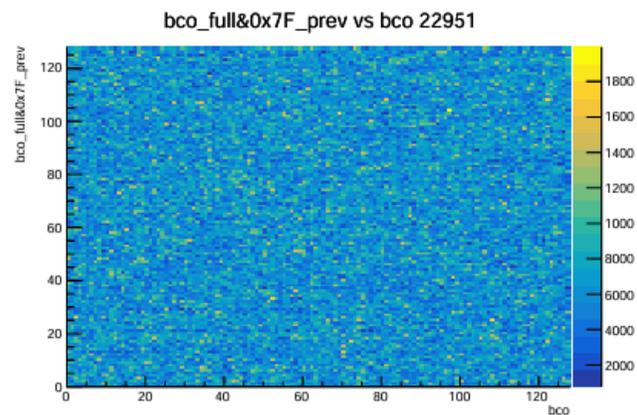
Run22950 intt5



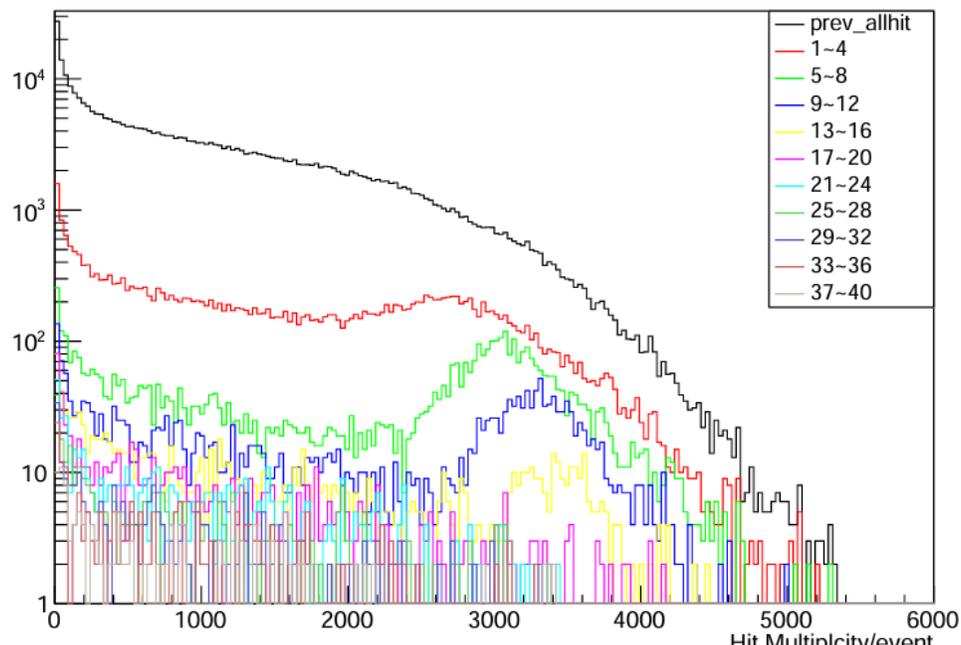
Mixup Multiplicity 22950



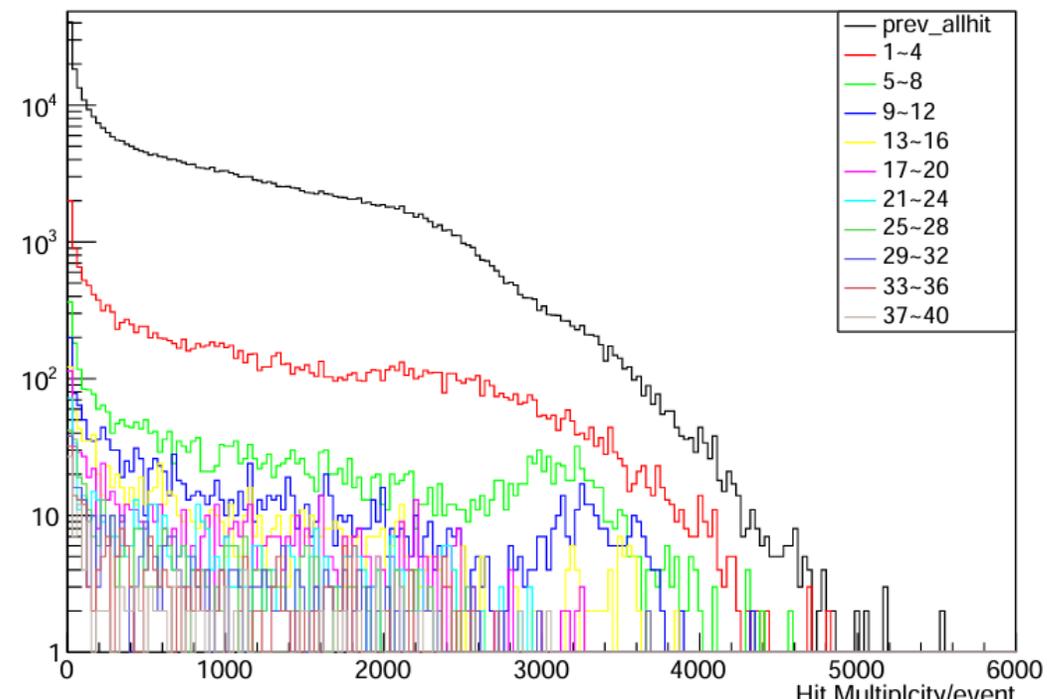
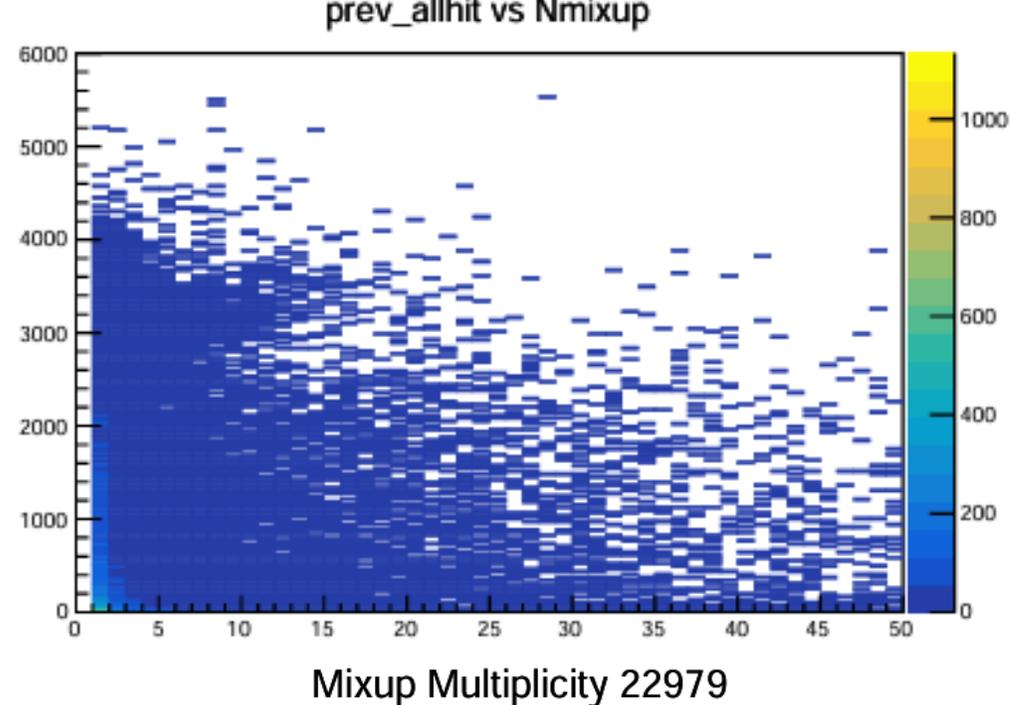
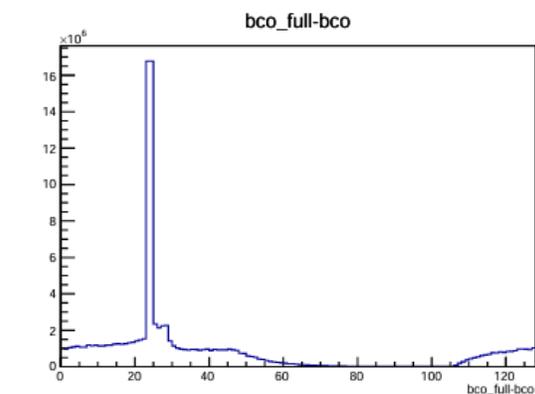
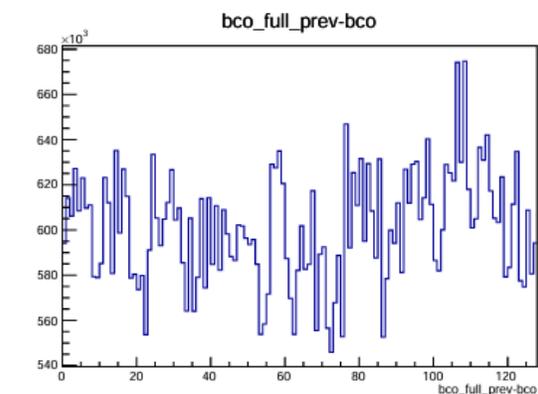
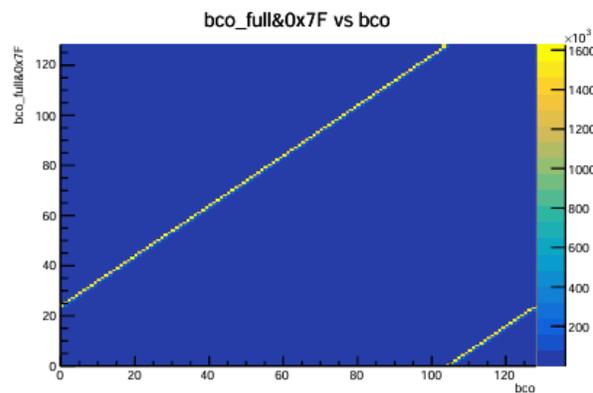
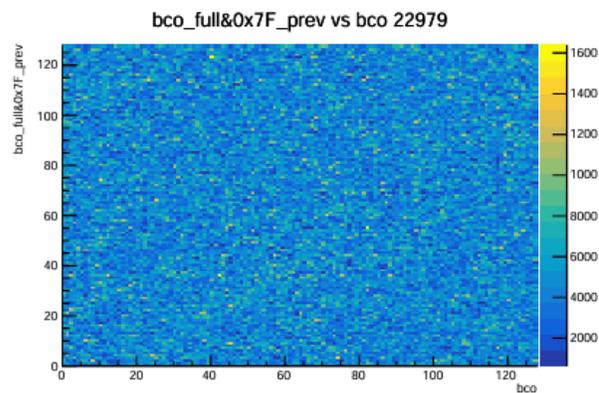
Run22951 intt5



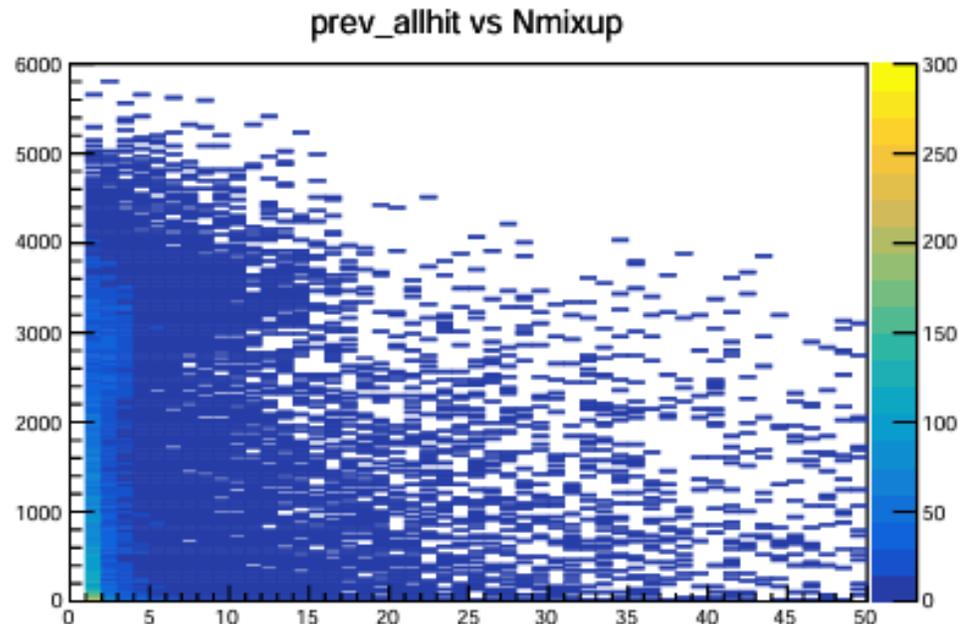
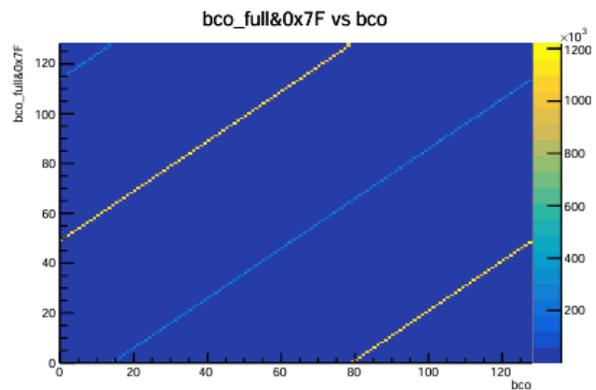
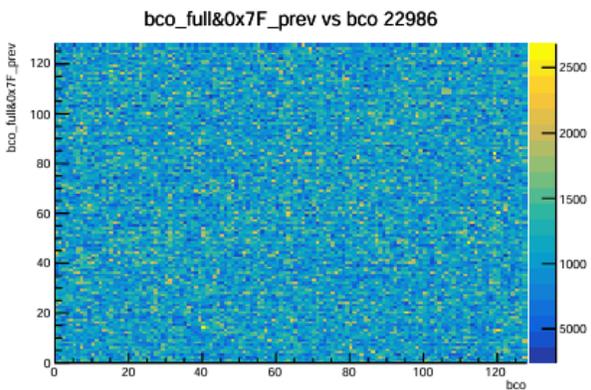
Mixup Multiplicity 22951



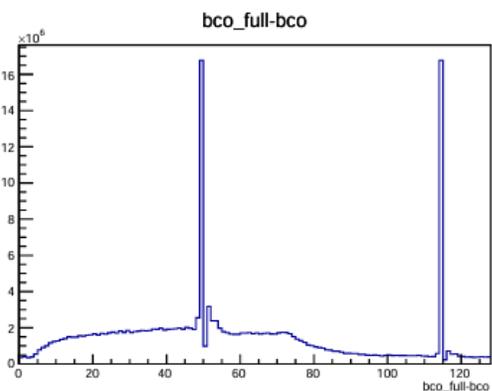
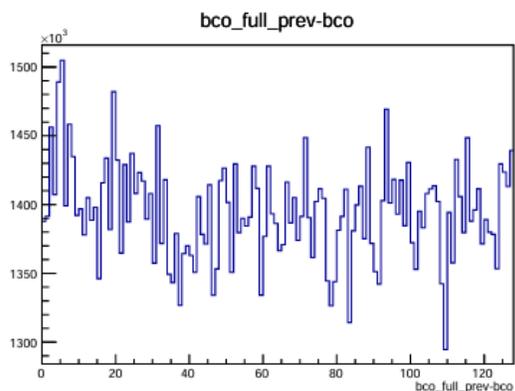
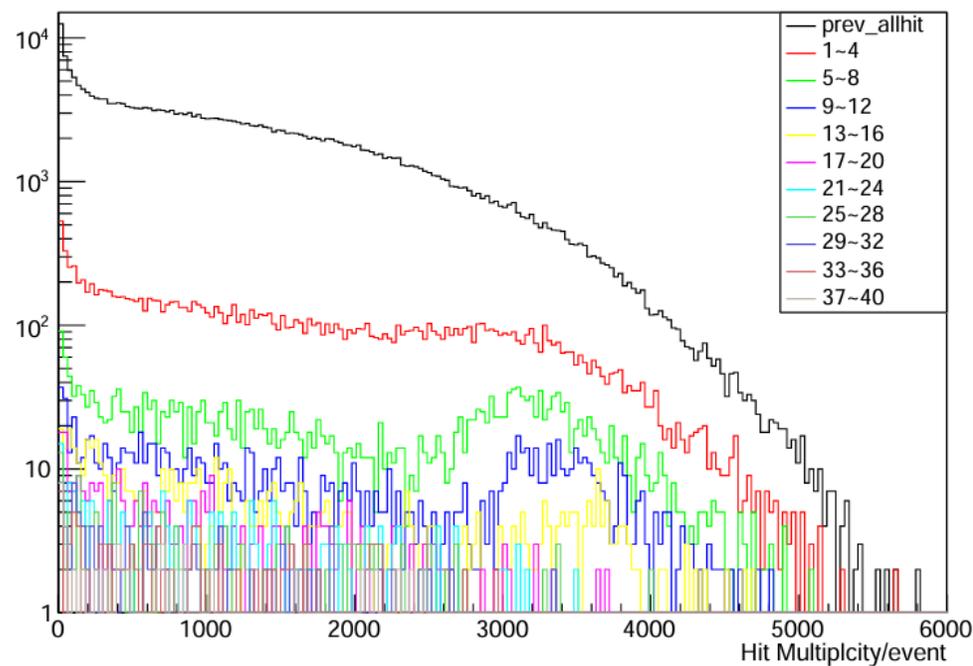
Run22979 intt5



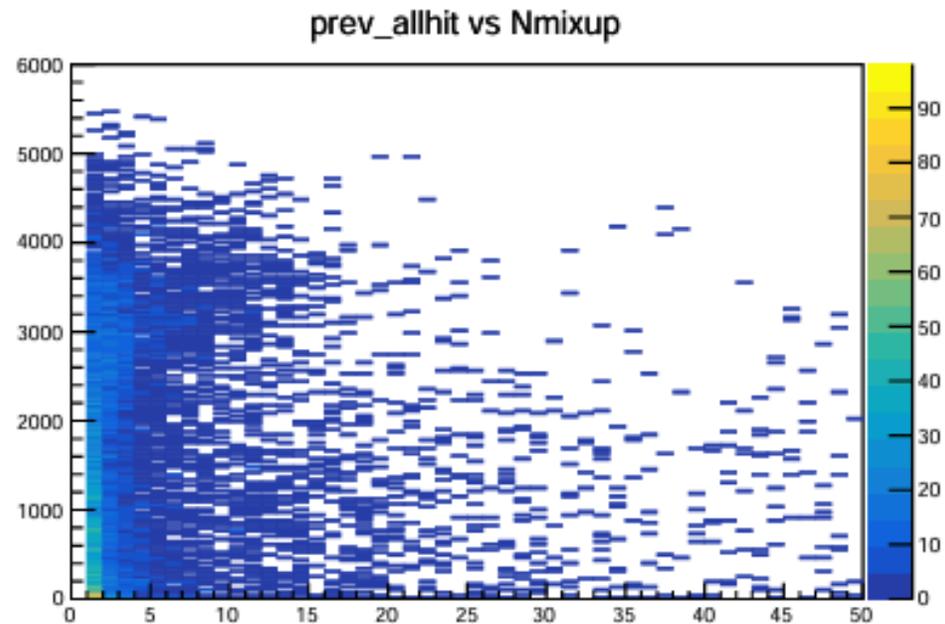
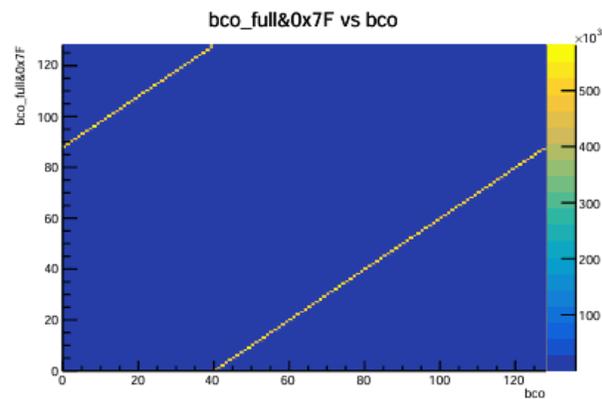
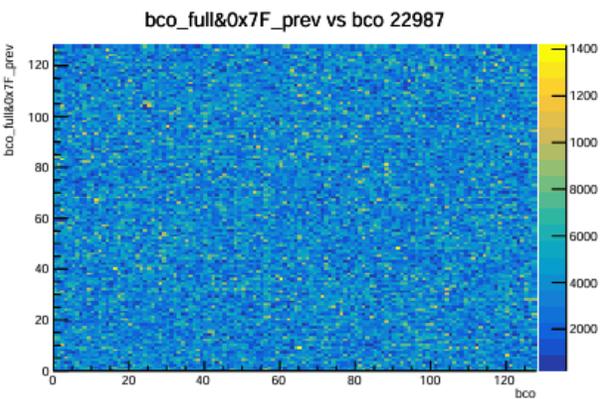
Run22986 intt5



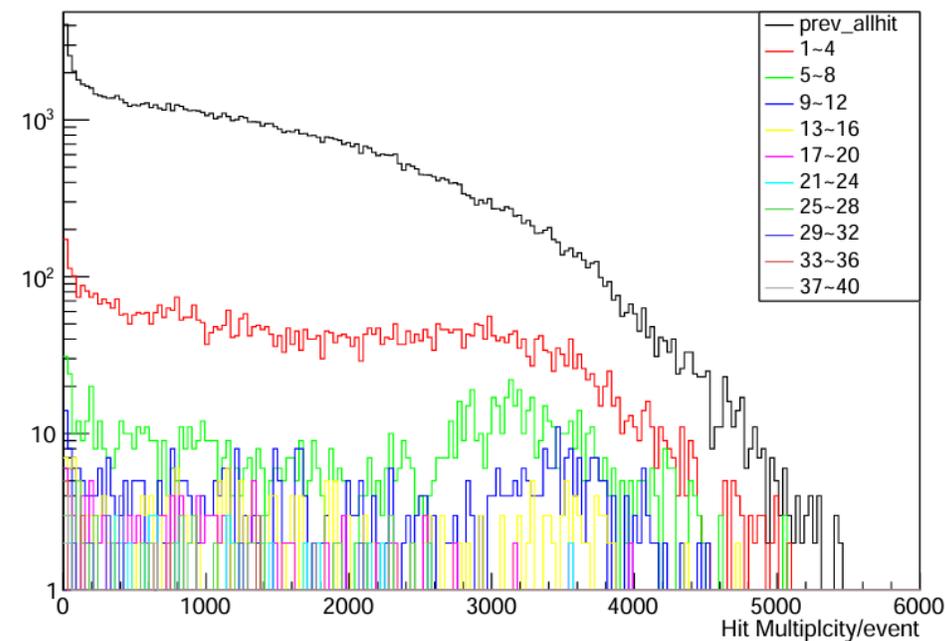
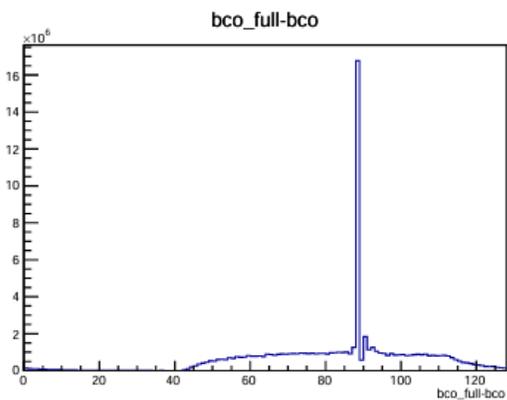
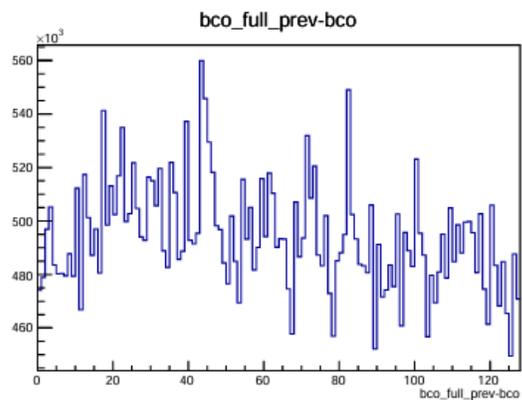
Mixup Multiplicity 22986



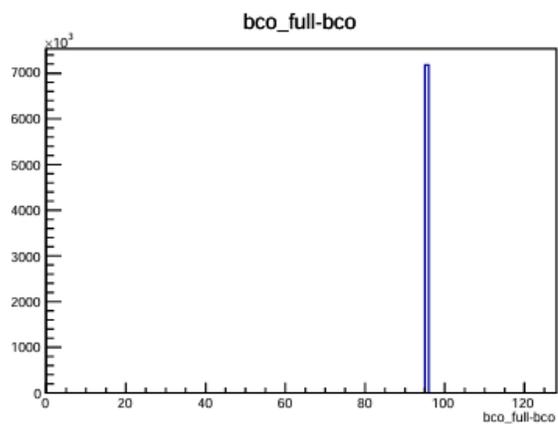
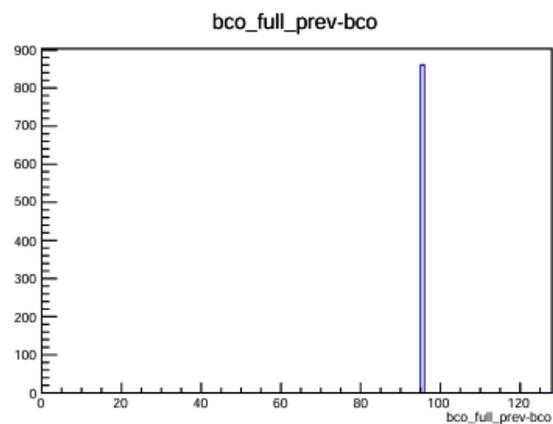
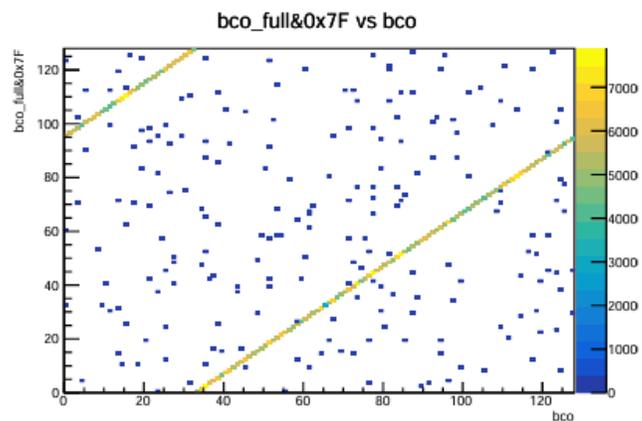
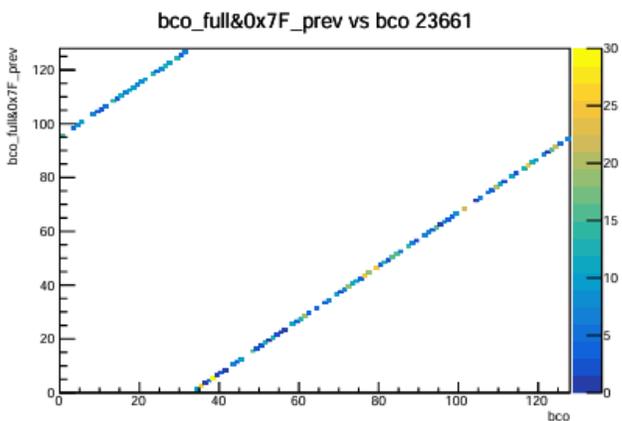
Run22987 intt5



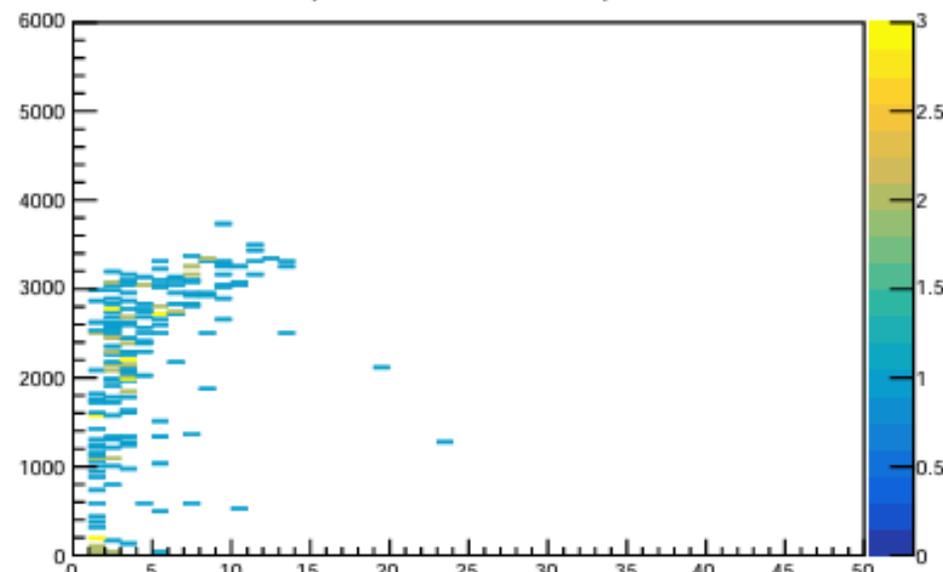
Mixup Multiplicity 22987



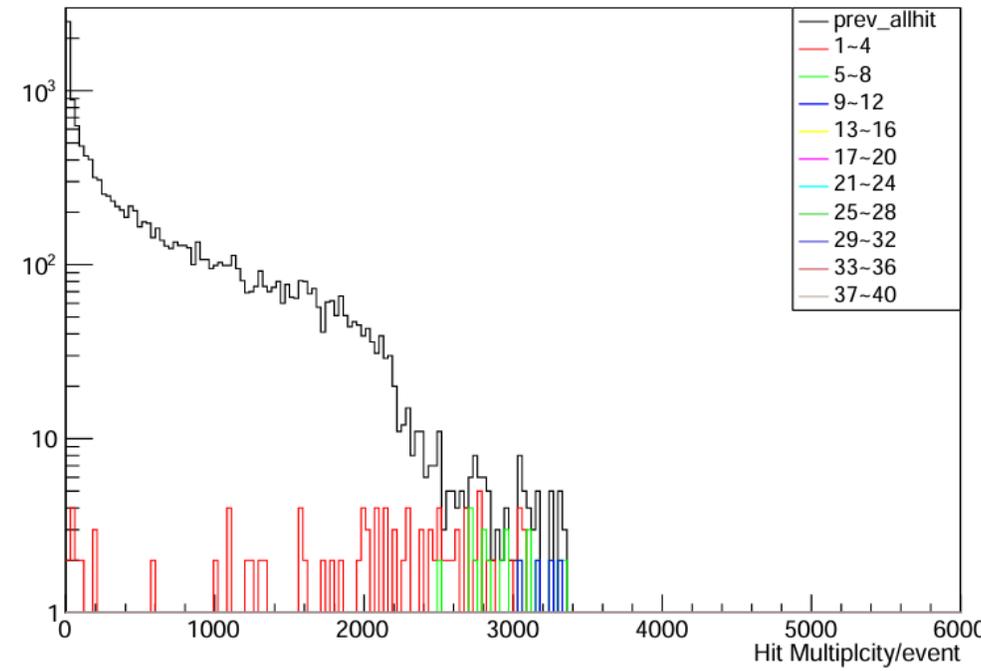
Run23661 intt5



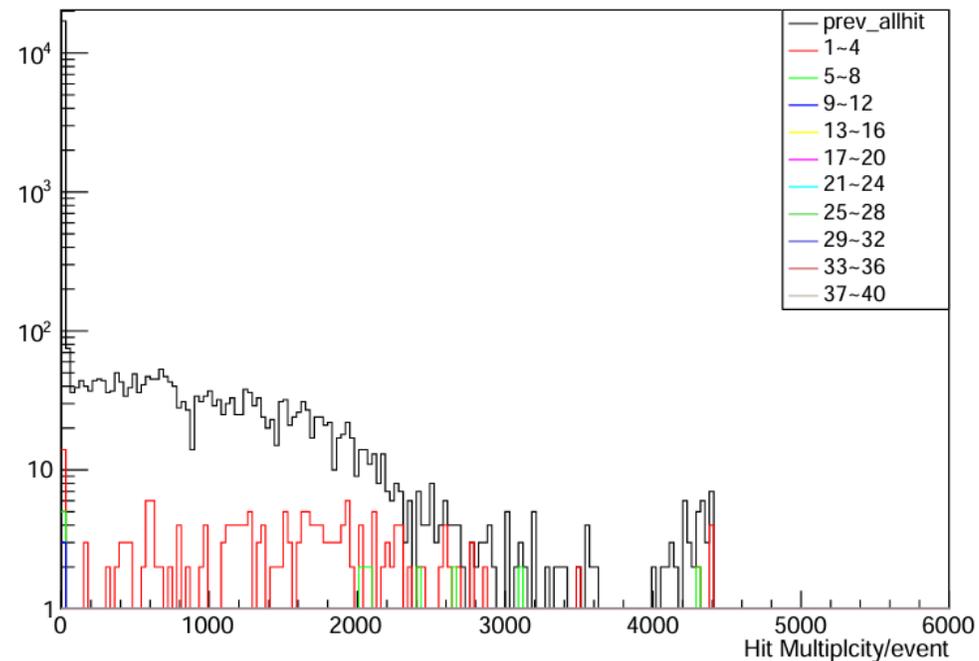
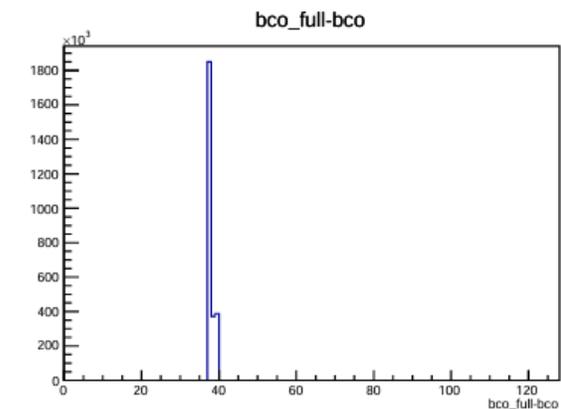
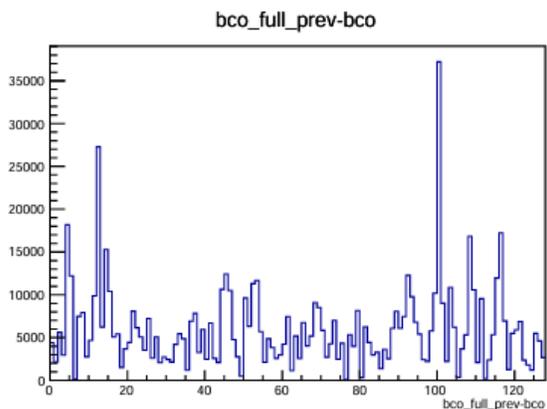
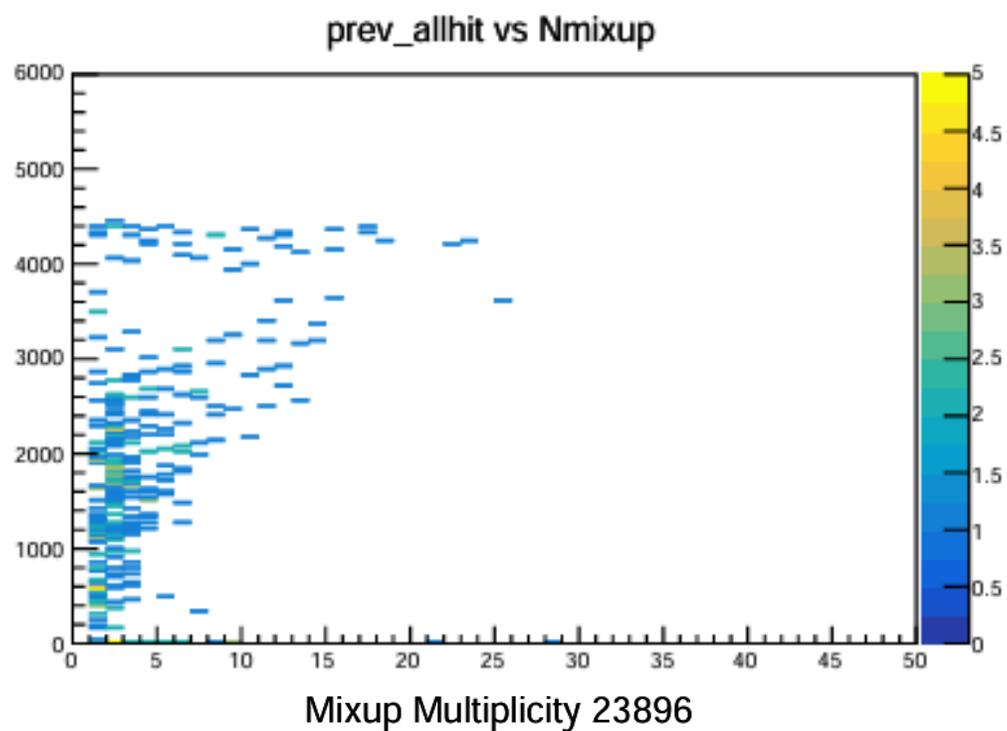
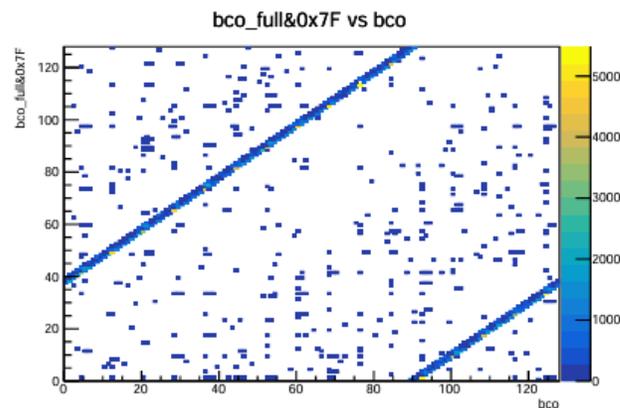
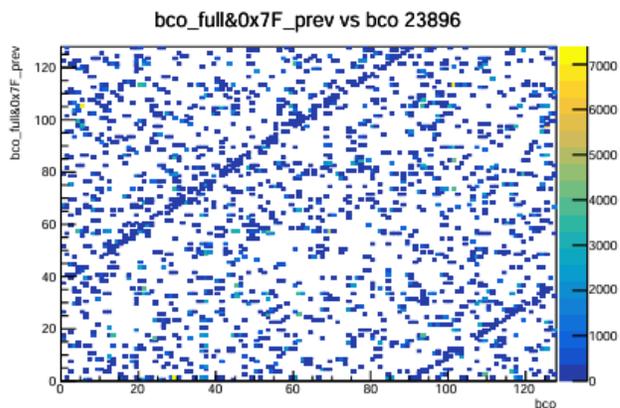
prev_allhit vs Nmixup



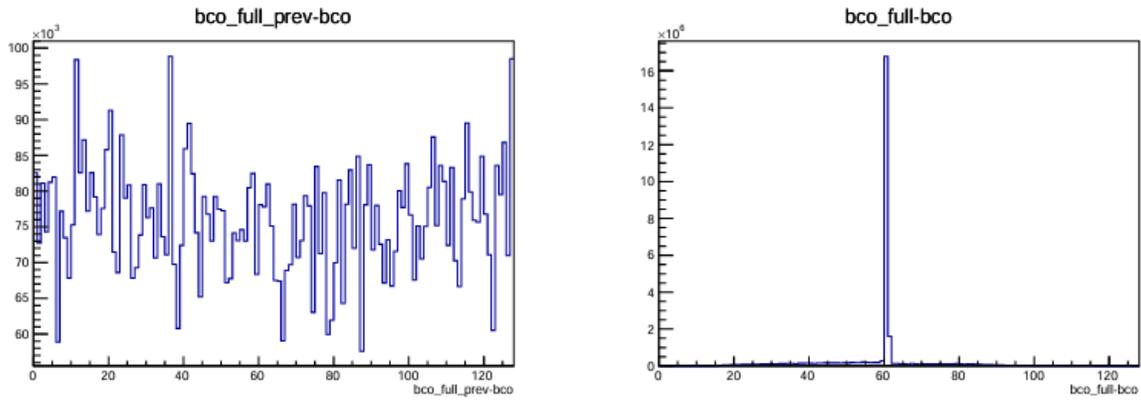
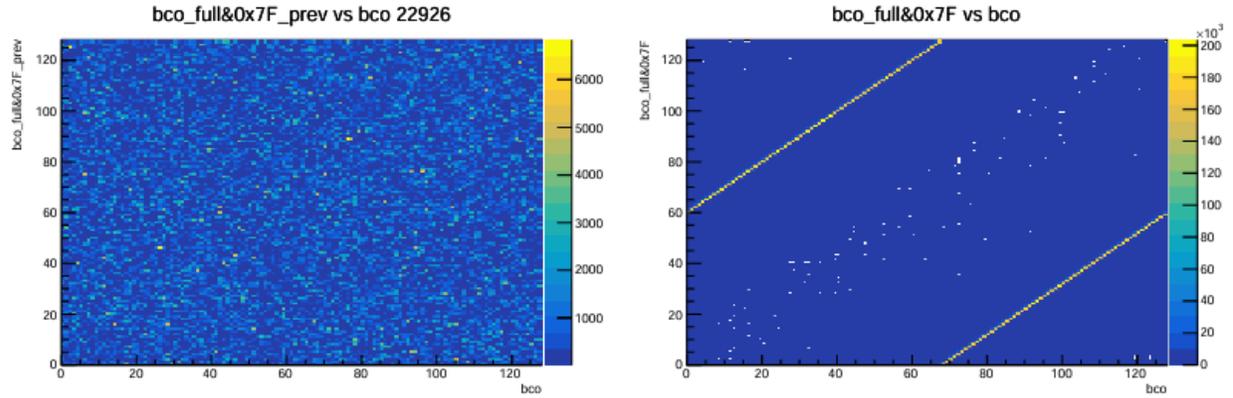
Mixup Multiplicity 23661



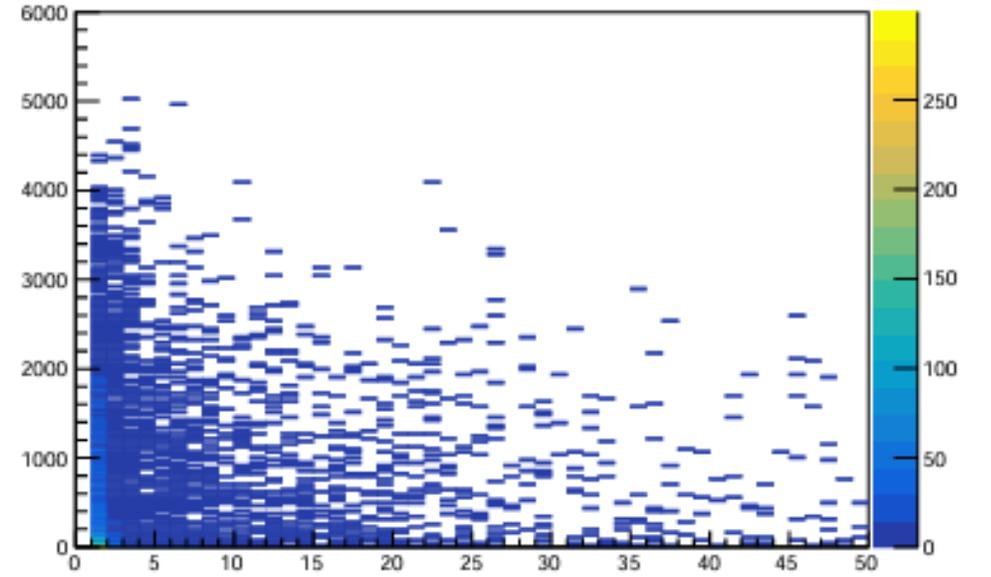
Run23896 intt5



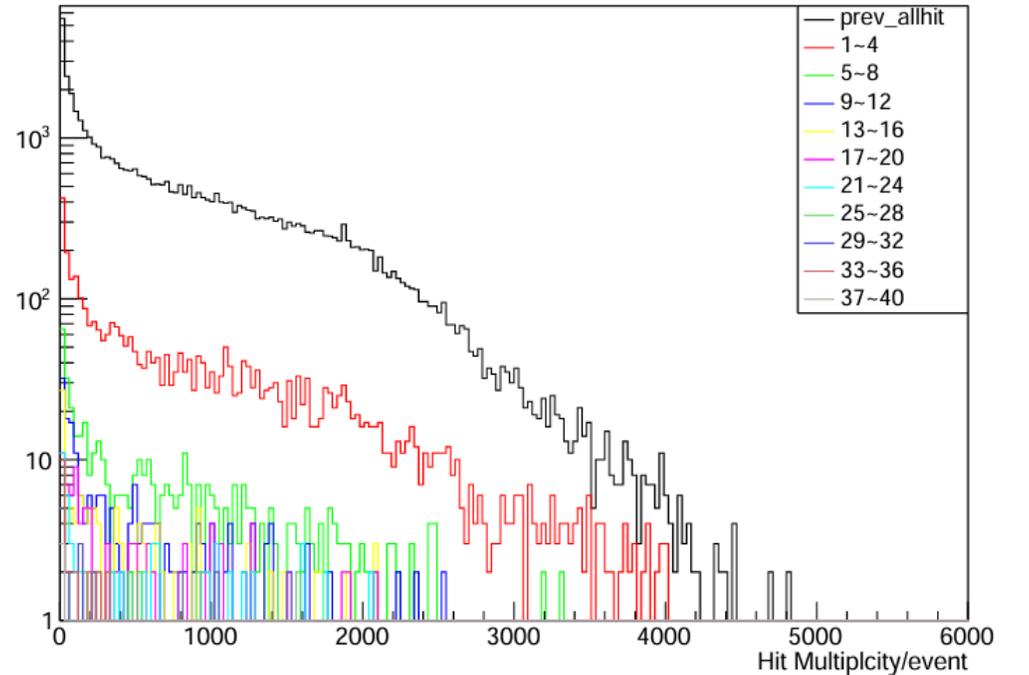
Run22926 intt6



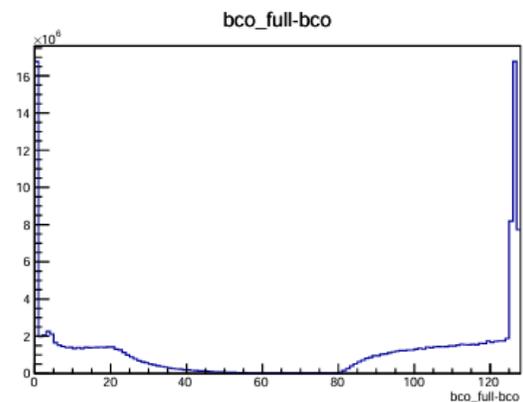
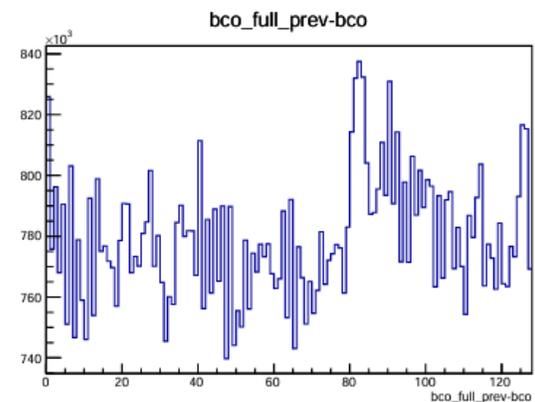
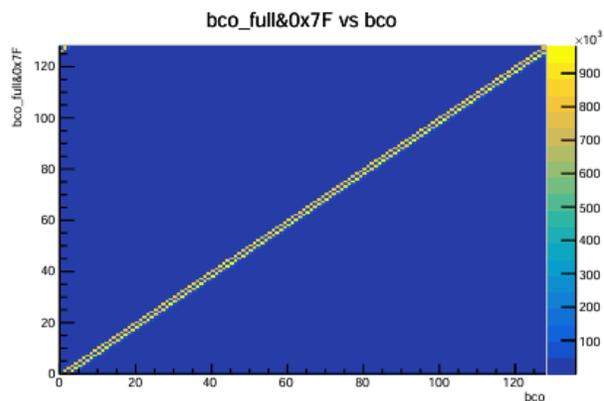
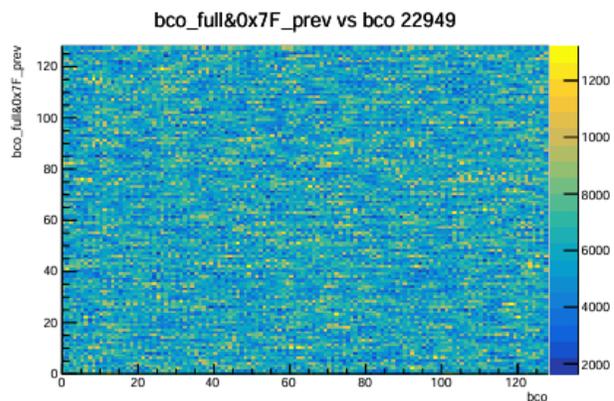
prev_allhit vs Nmixup



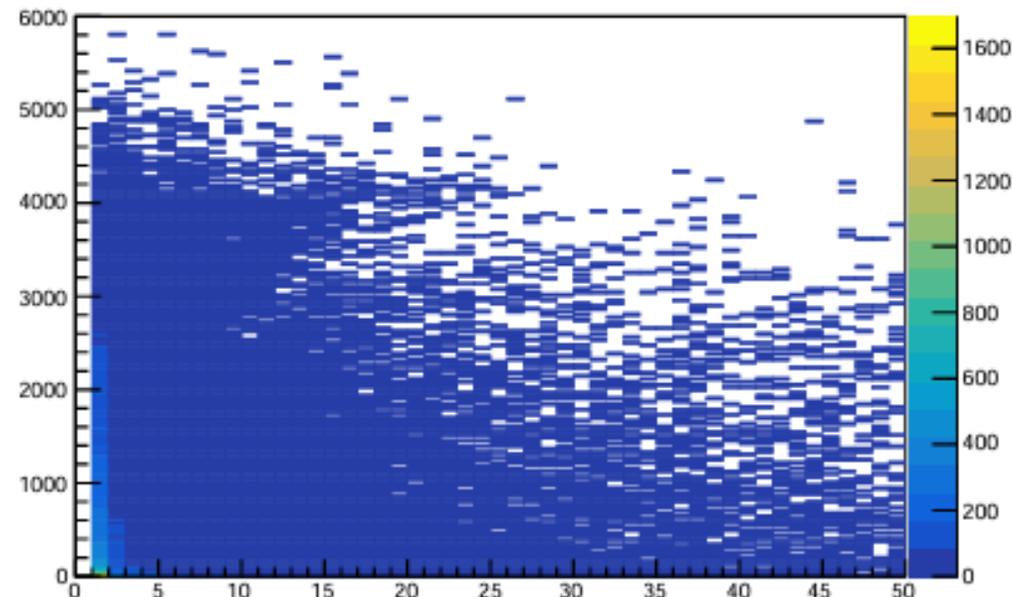
Mixup Multiplicity 22926



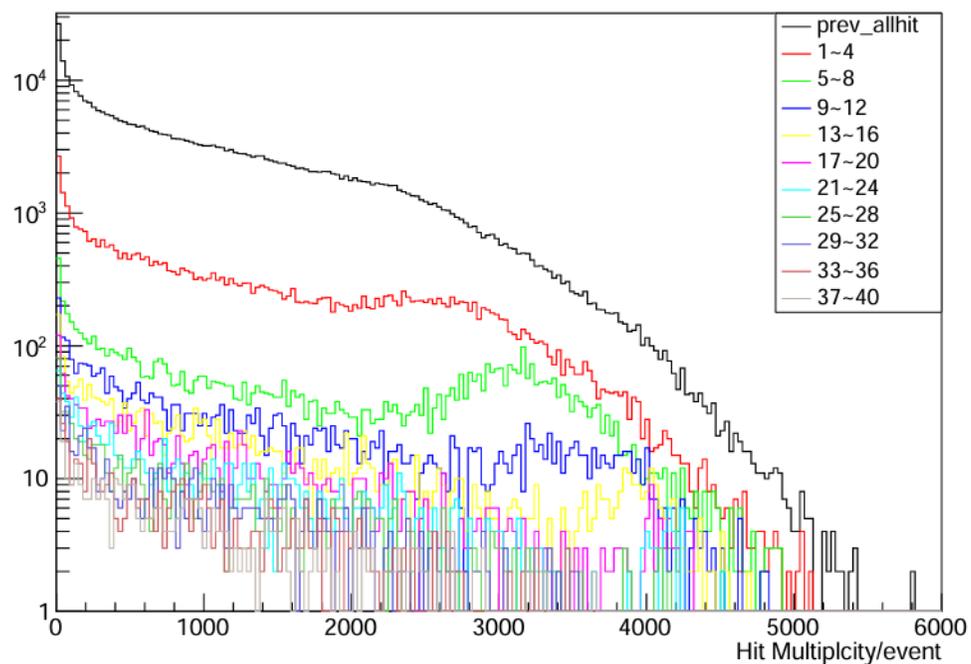
Run22949 intt6



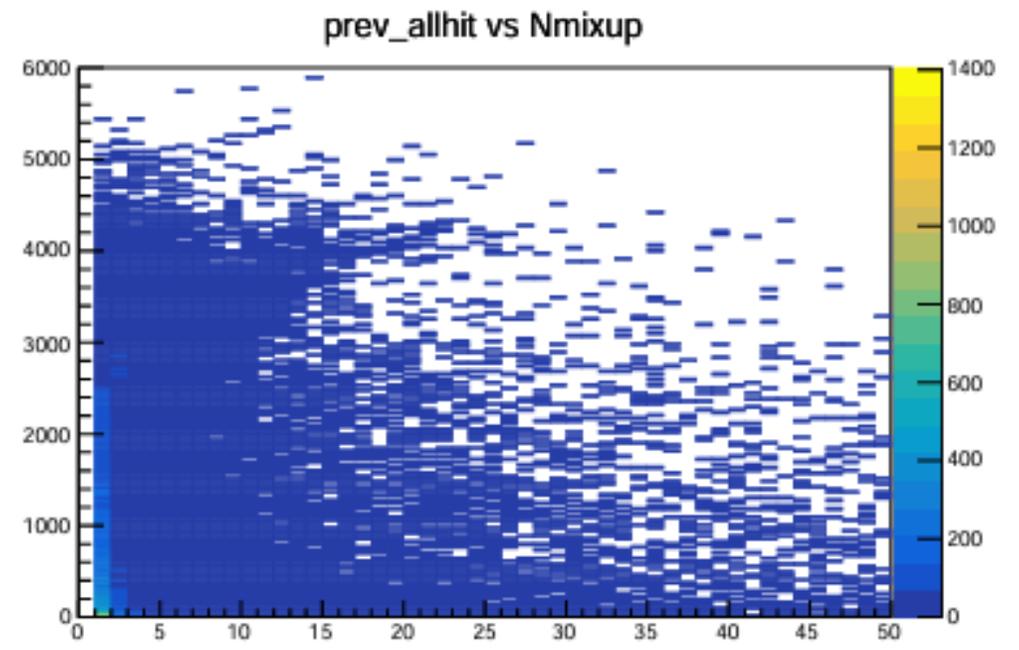
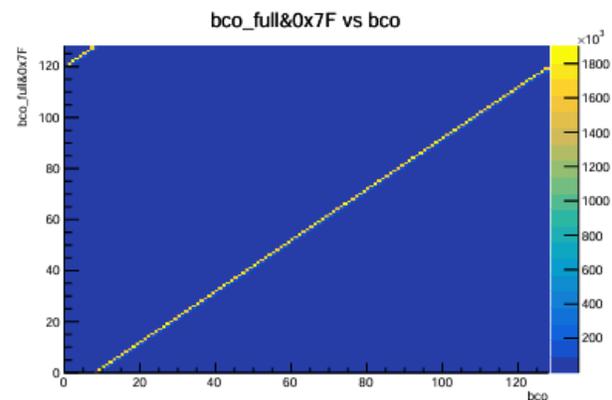
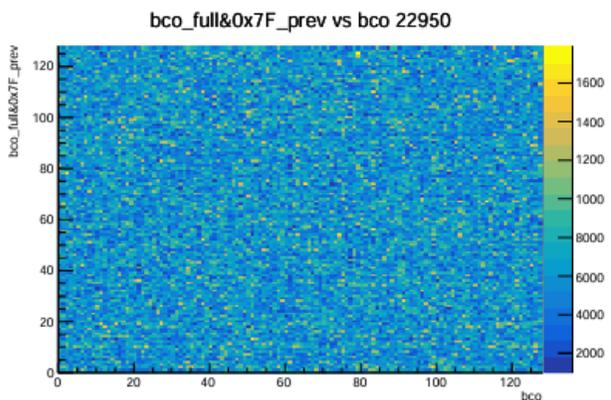
prev_allhit vs Nmixup



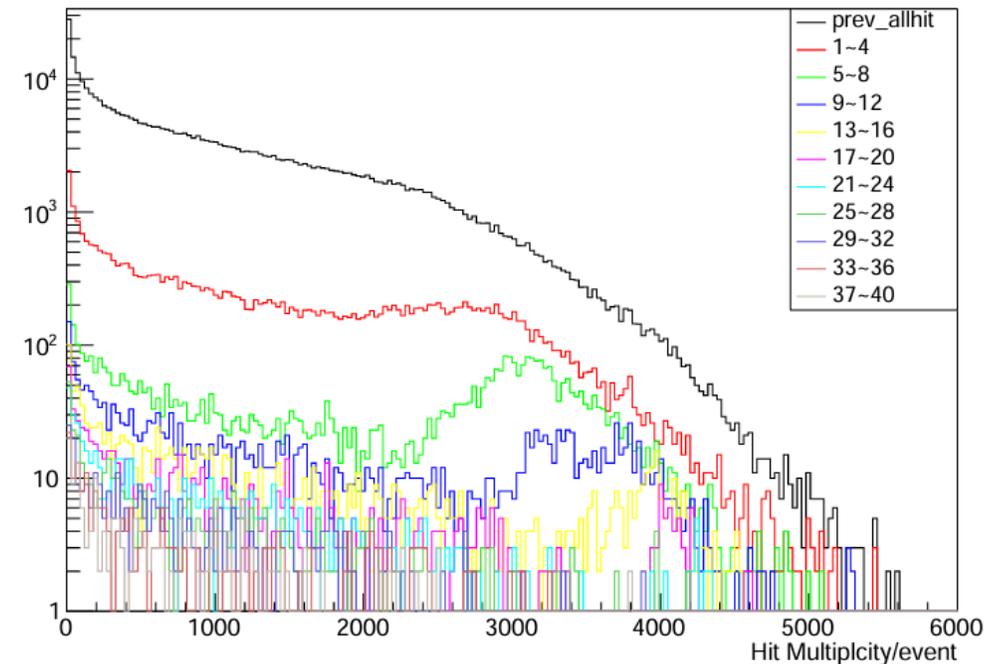
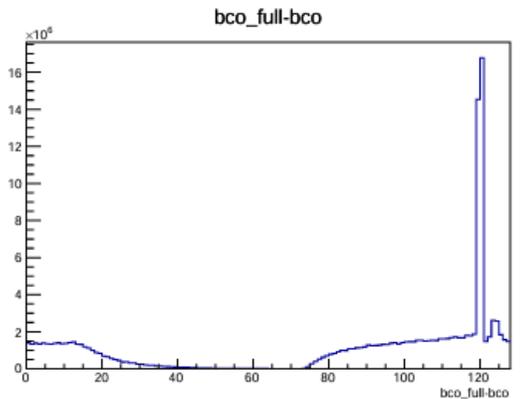
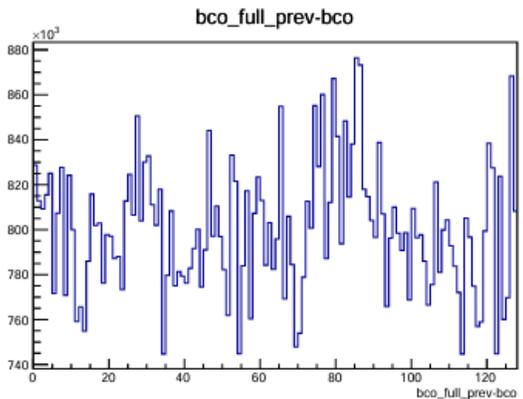
Mixup Multiplicity 22949



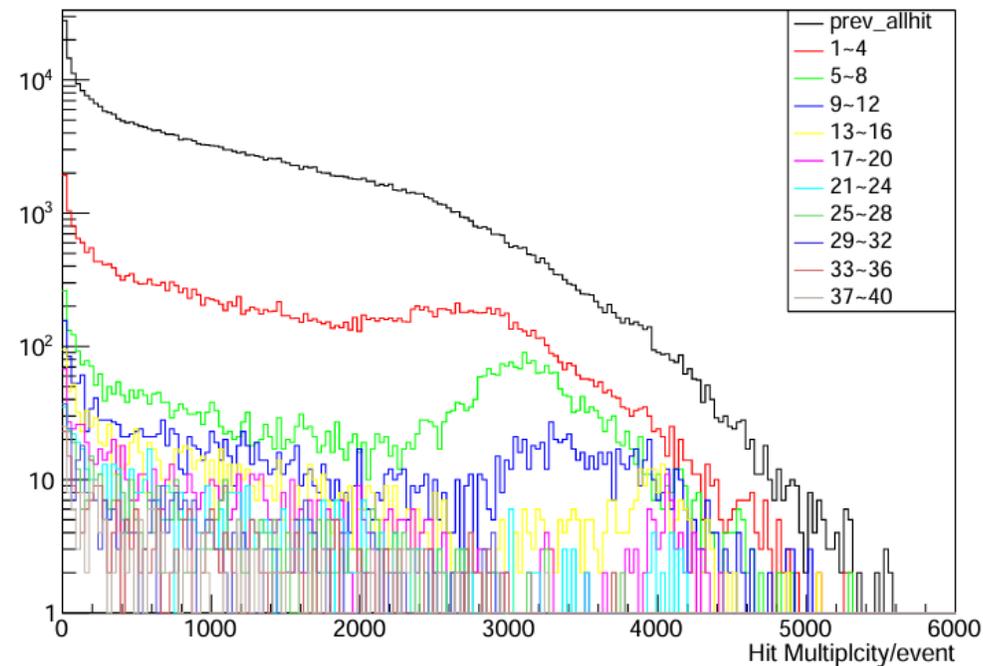
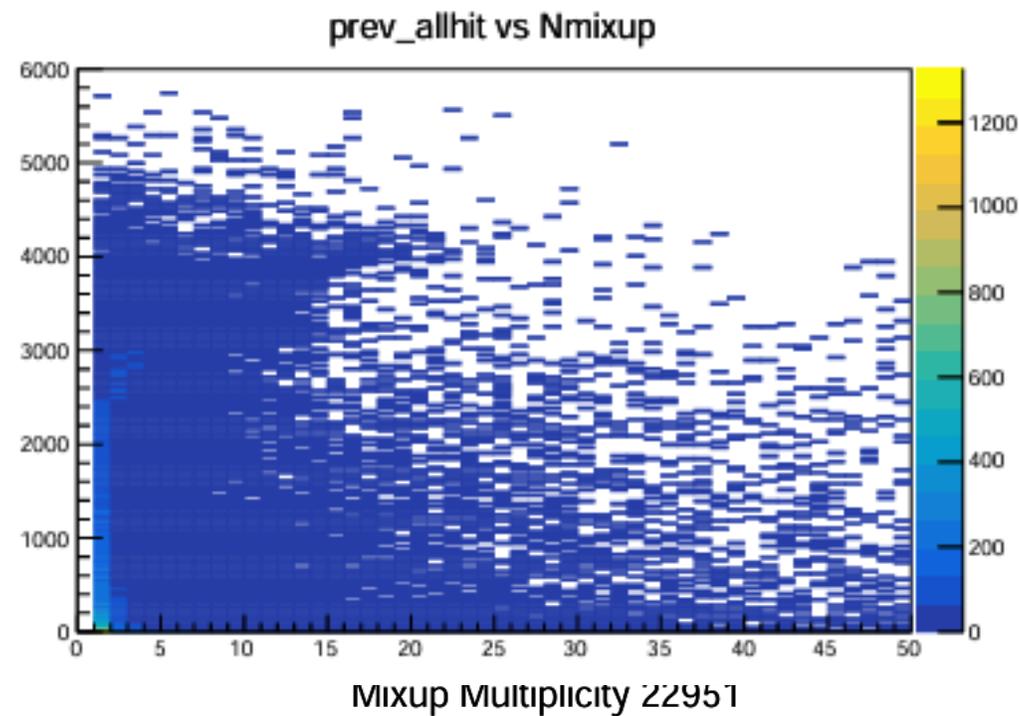
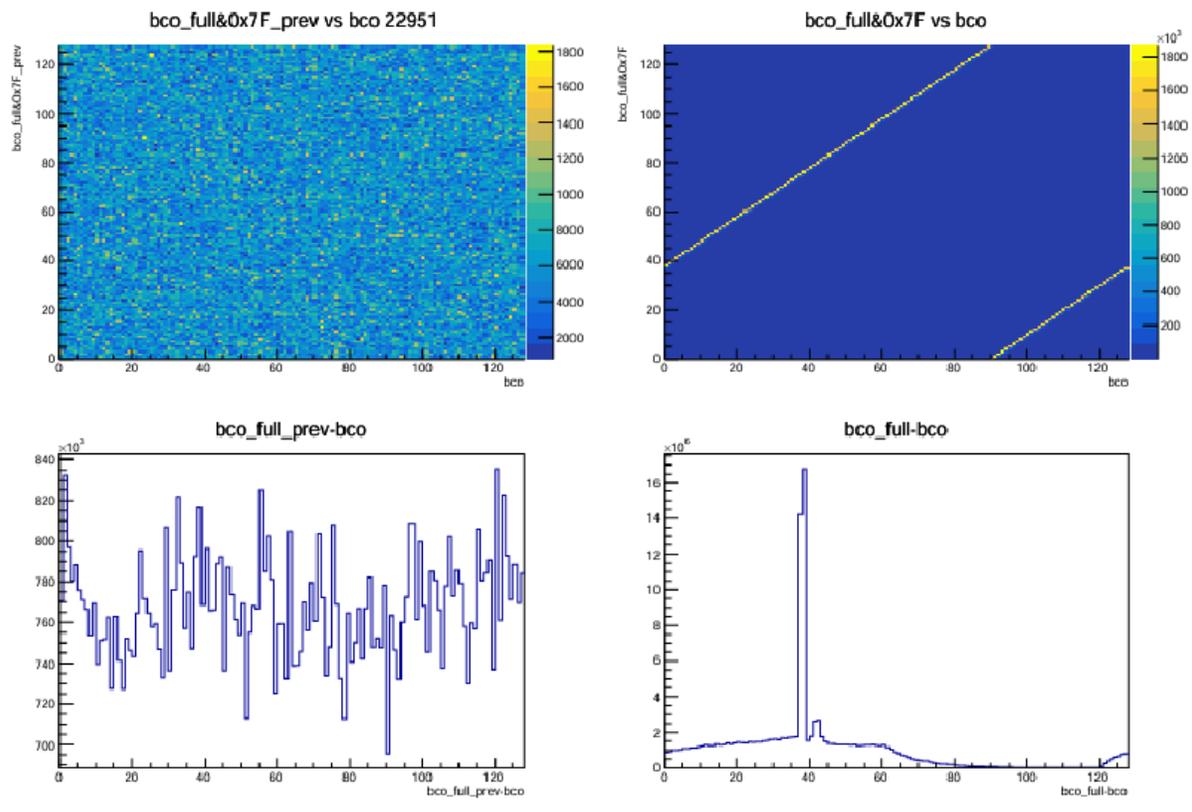
Run22950 intt6



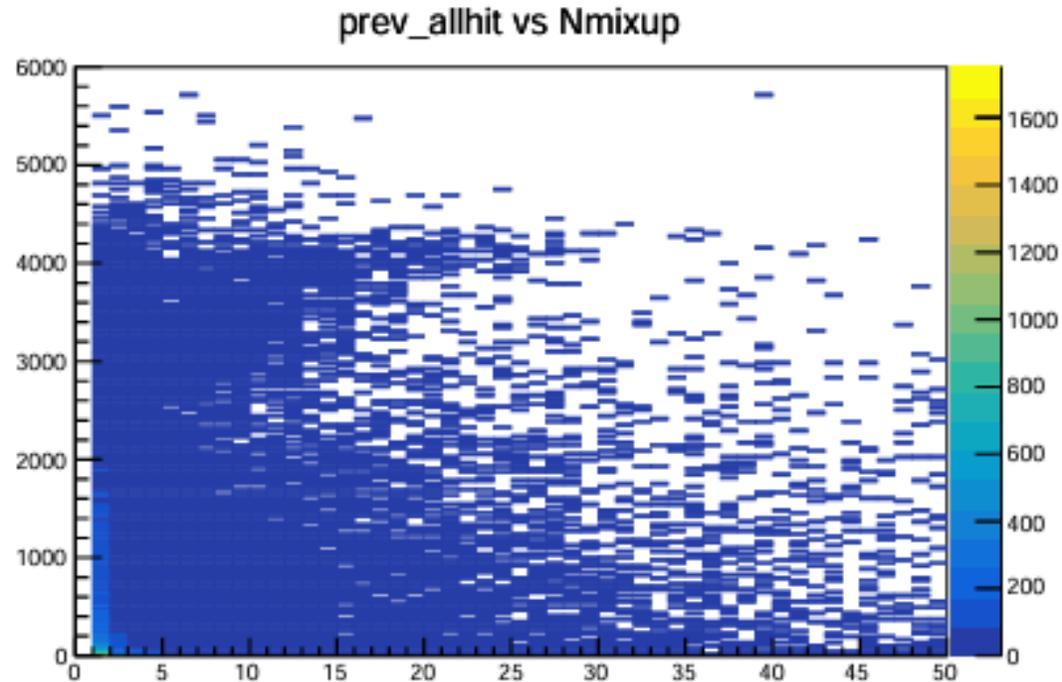
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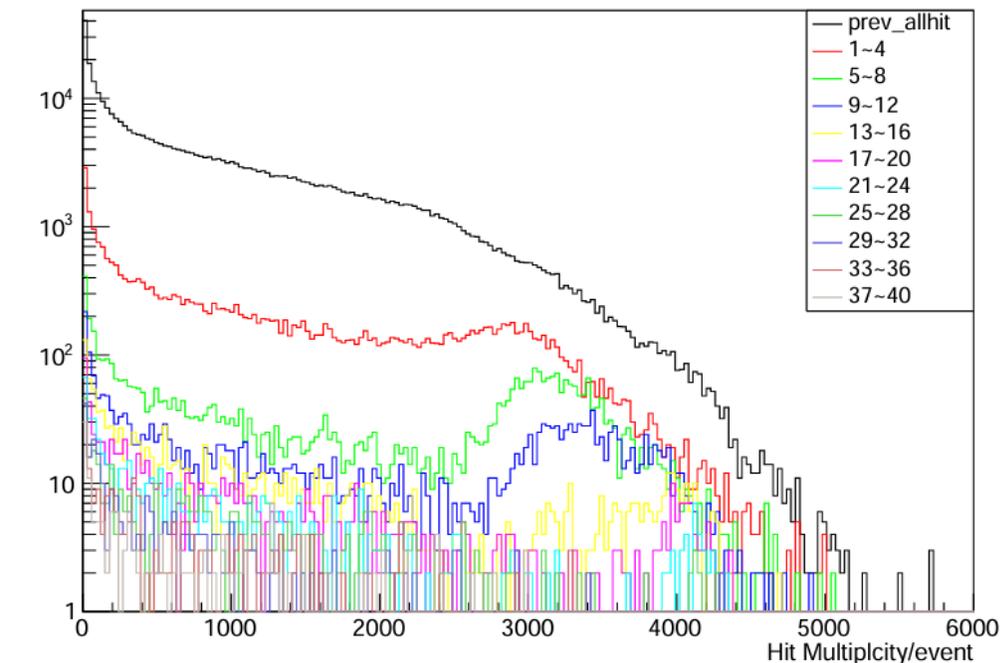
Run22951 intt6



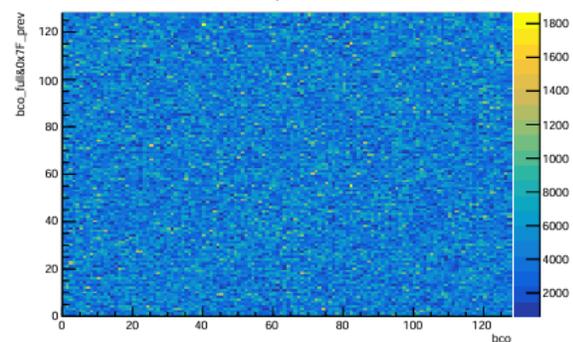
Run22979 intt6



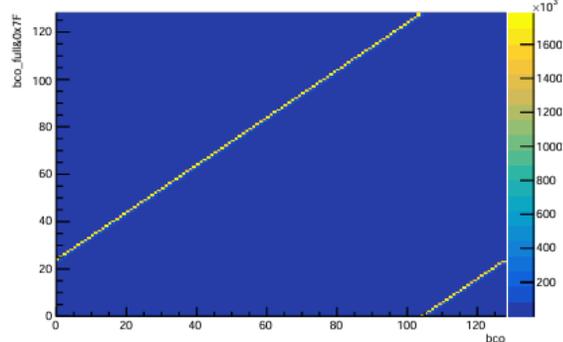
Mixup Multiplicity 22979



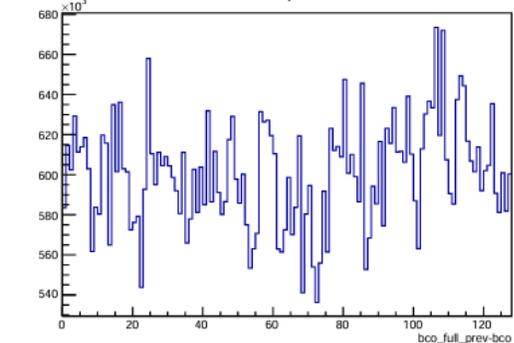
bco_full&0x7F_prev vs bco 22979



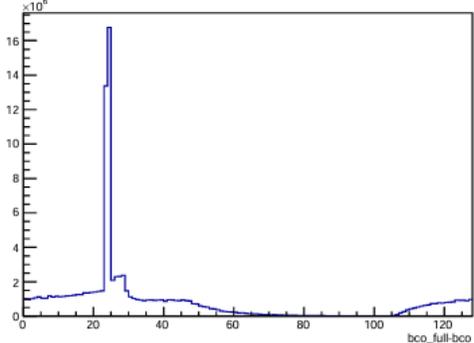
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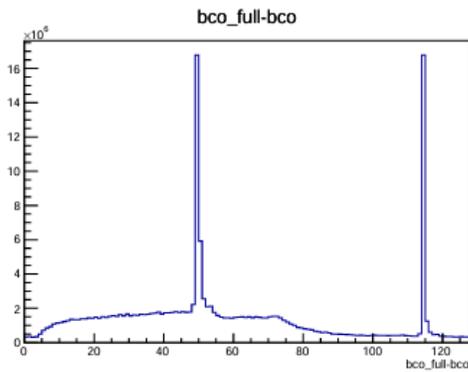
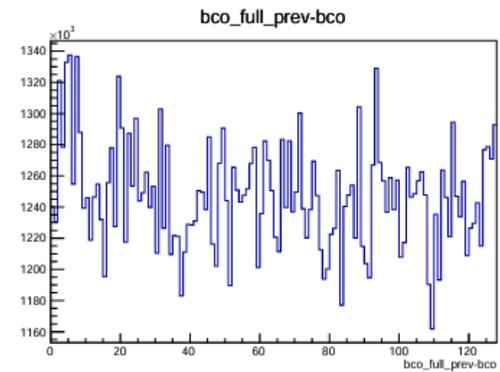
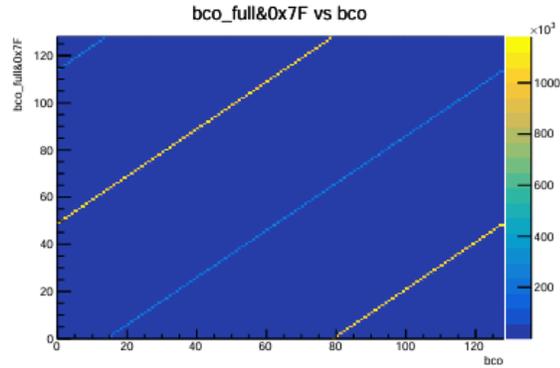
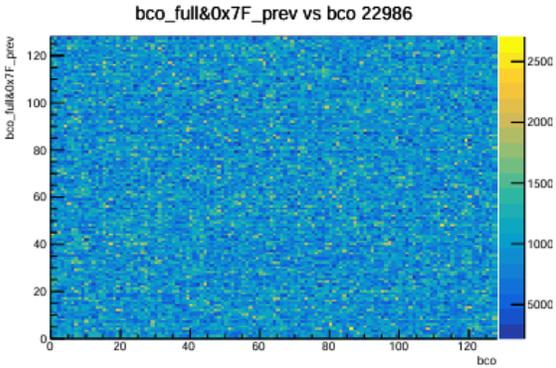
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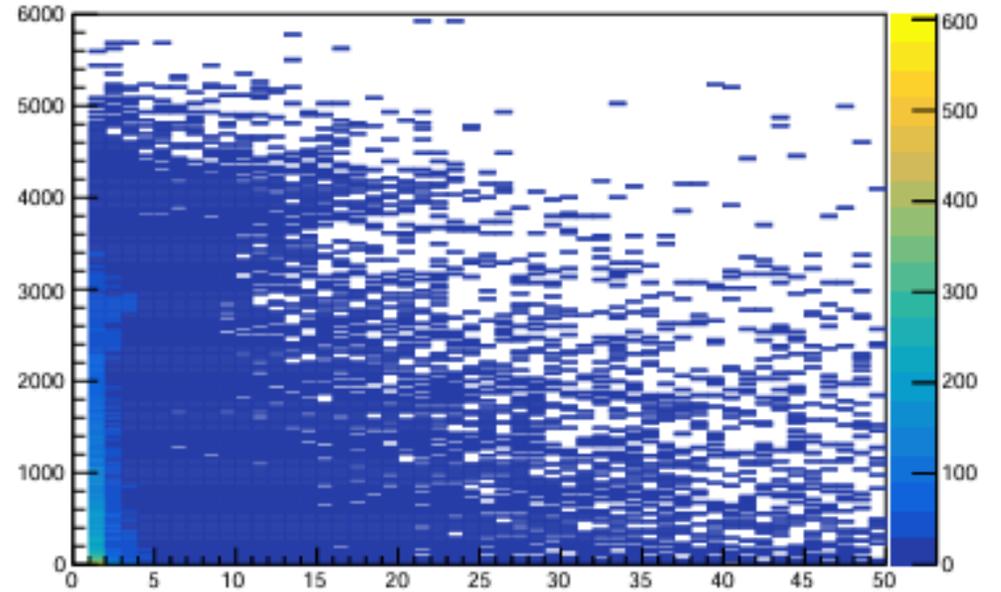
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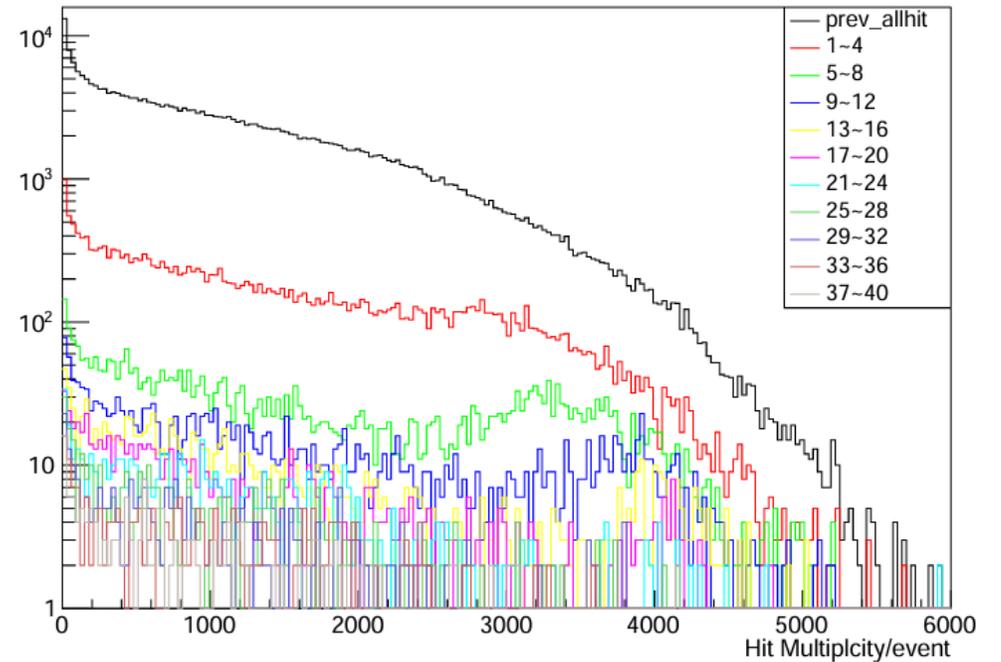
Run22986 intt6



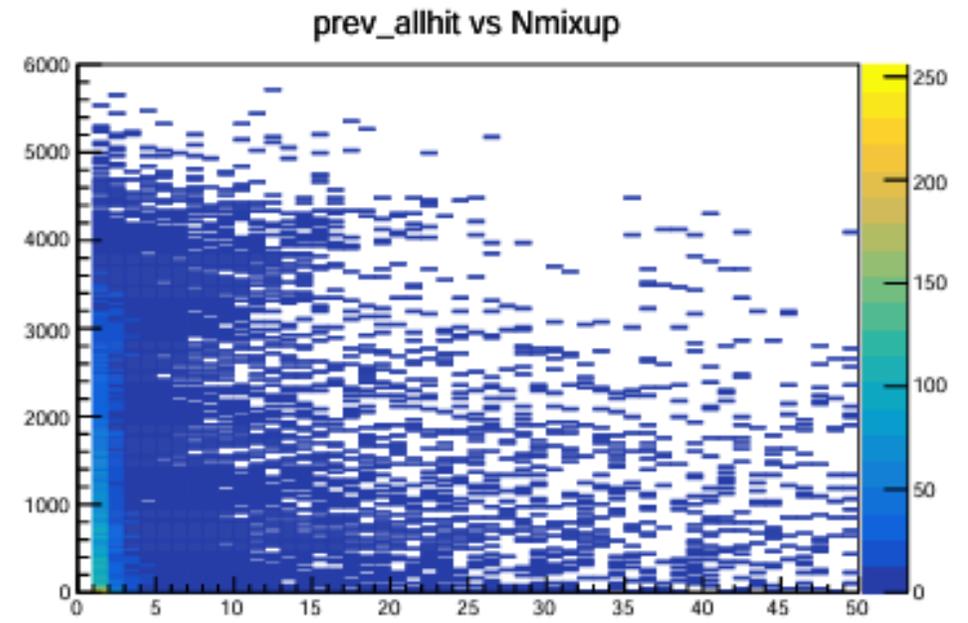
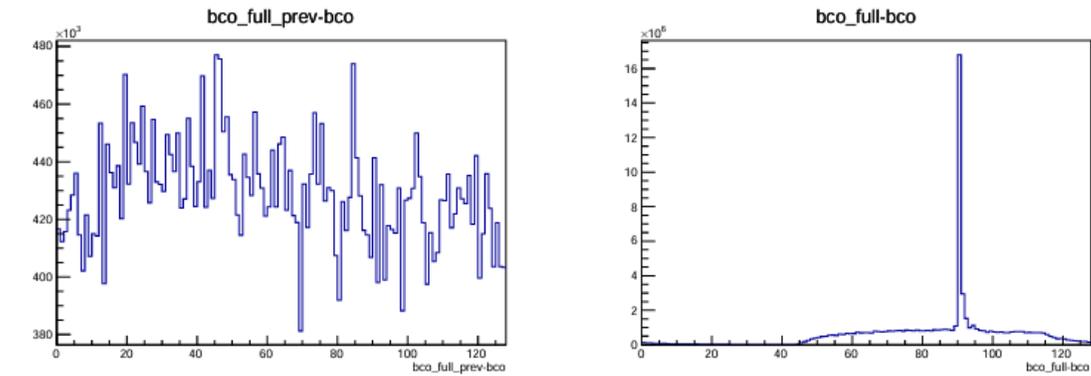
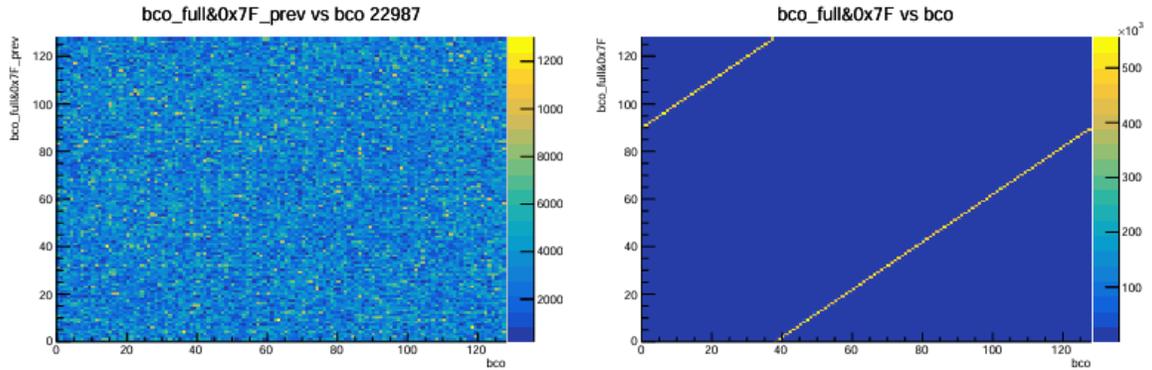
prev_allhit vs Nmixup



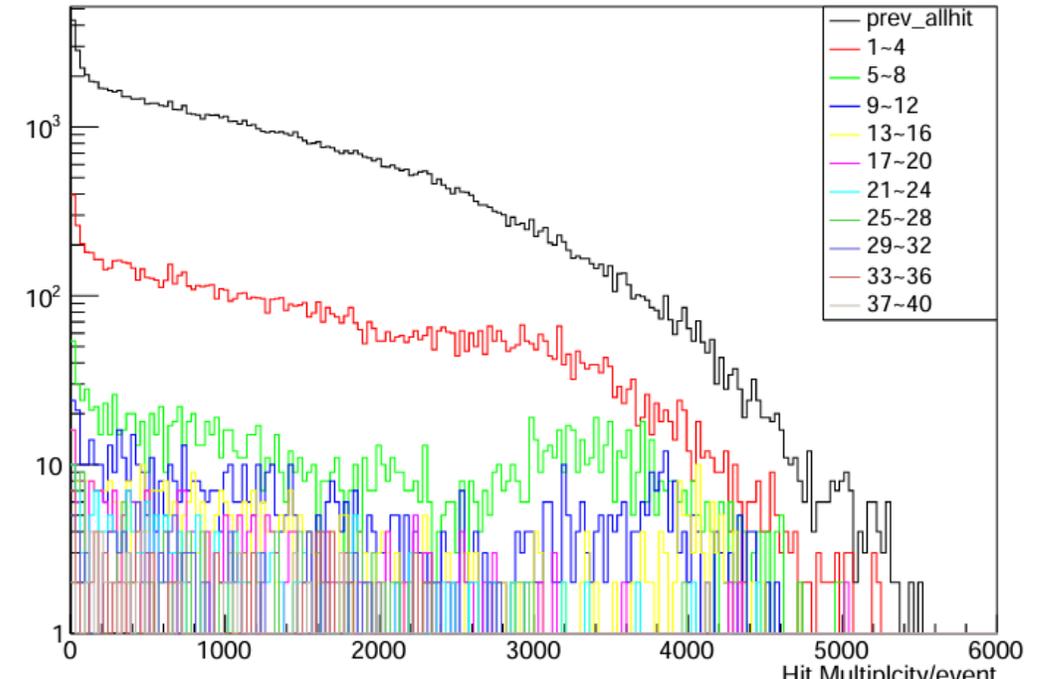
Mixup Multiplicity 22986



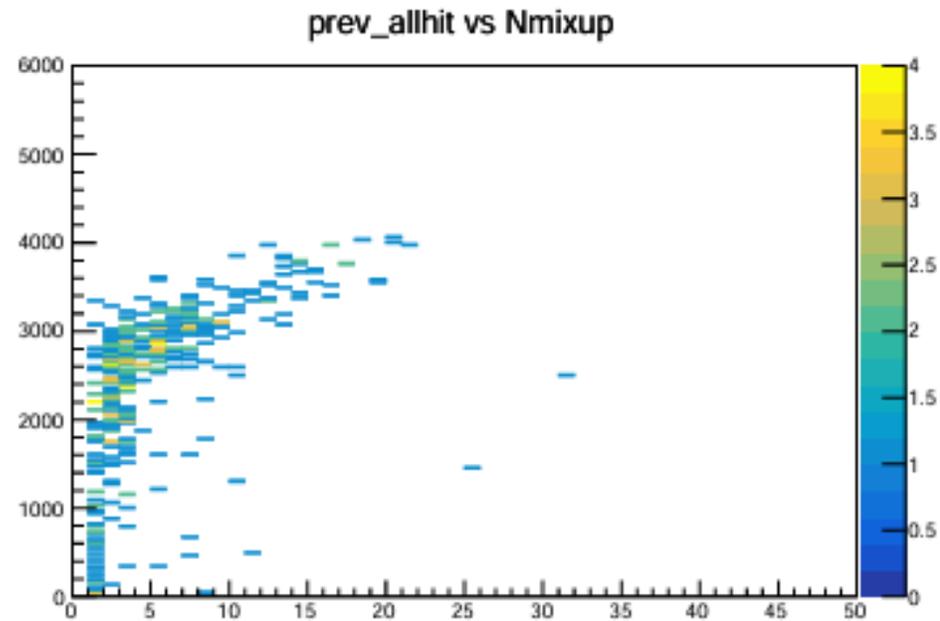
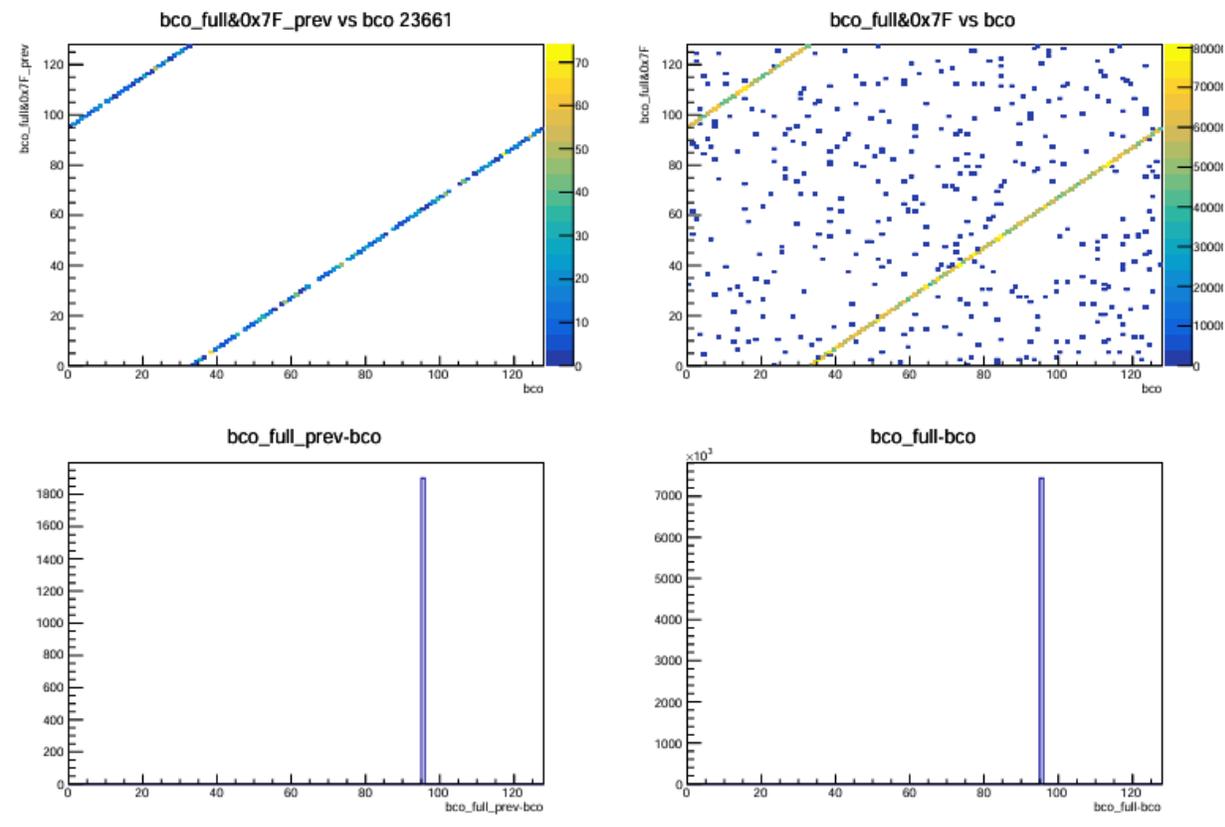
Run22987 intt6



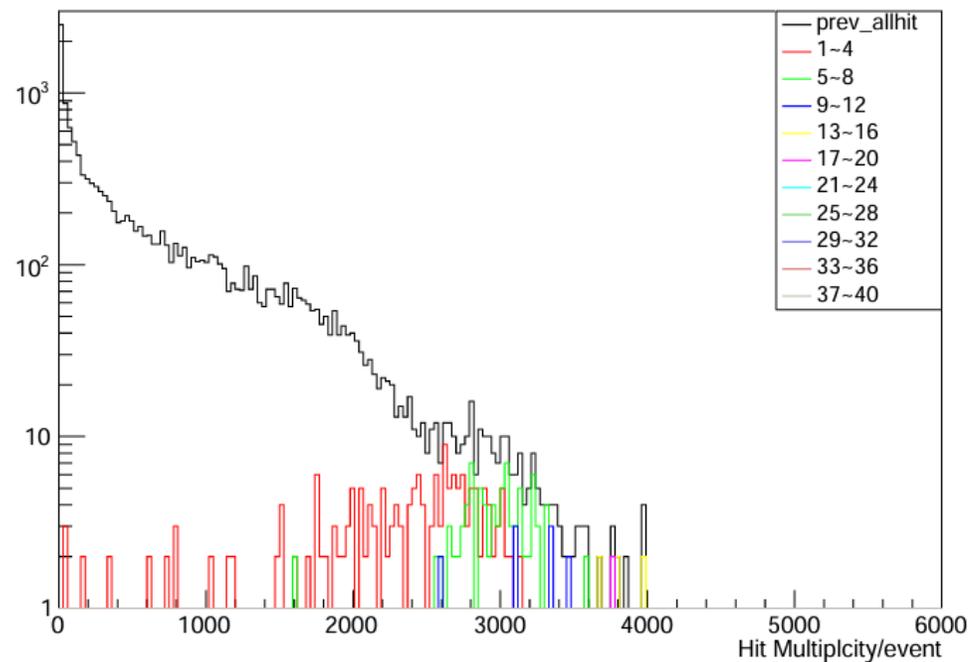
Mixup Multiplicity 22987



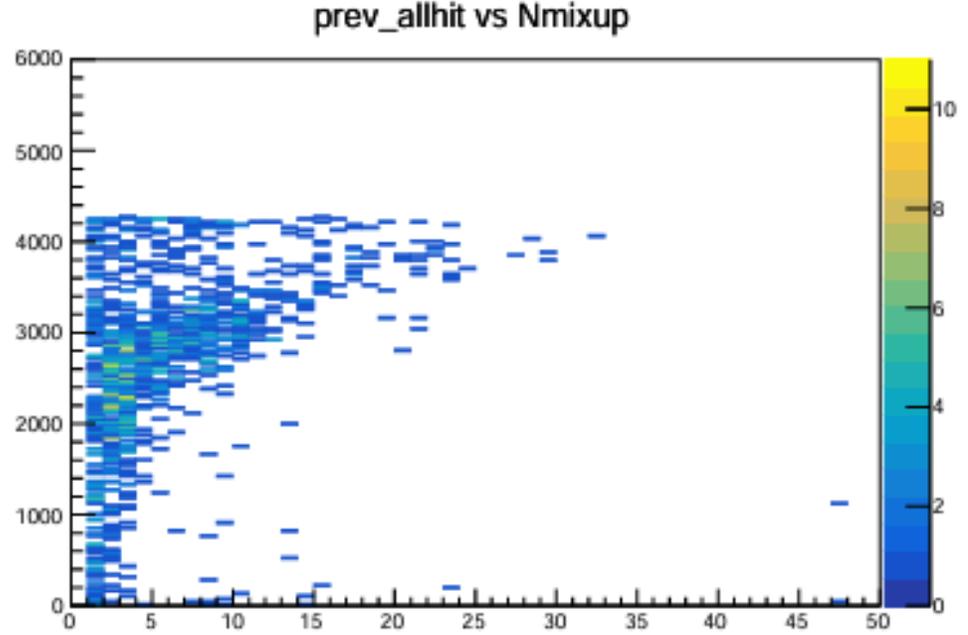
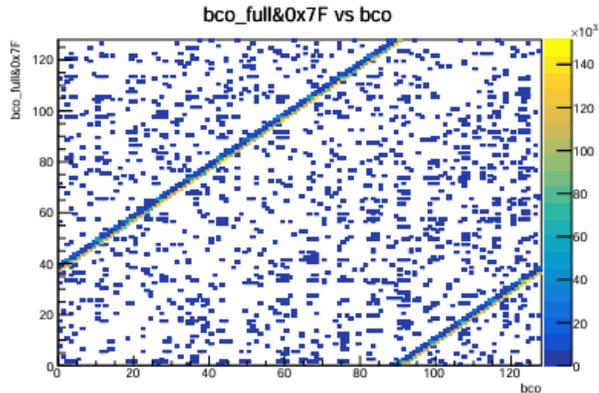
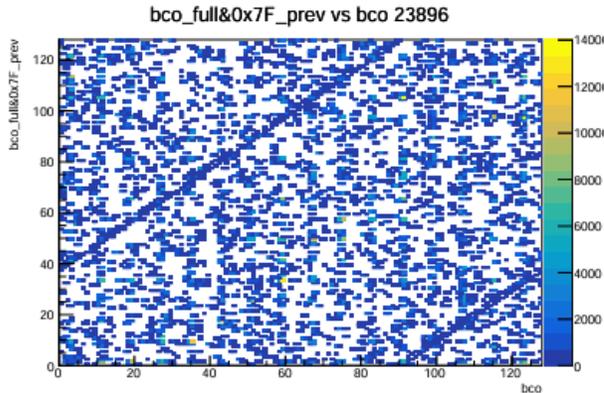
Run23661 intt6



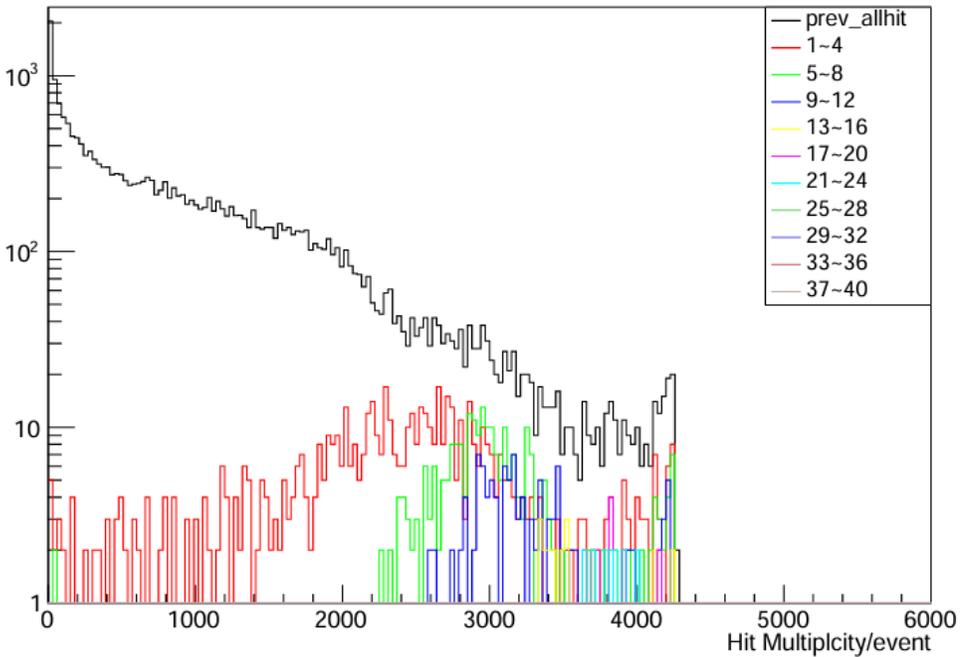
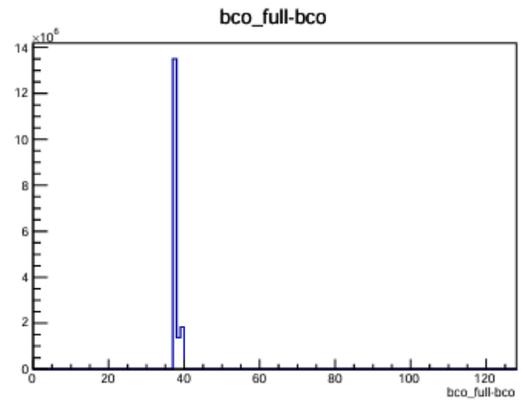
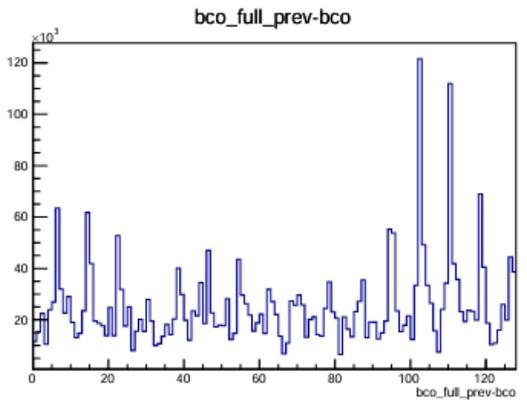
Mixup Multiplicity 23661



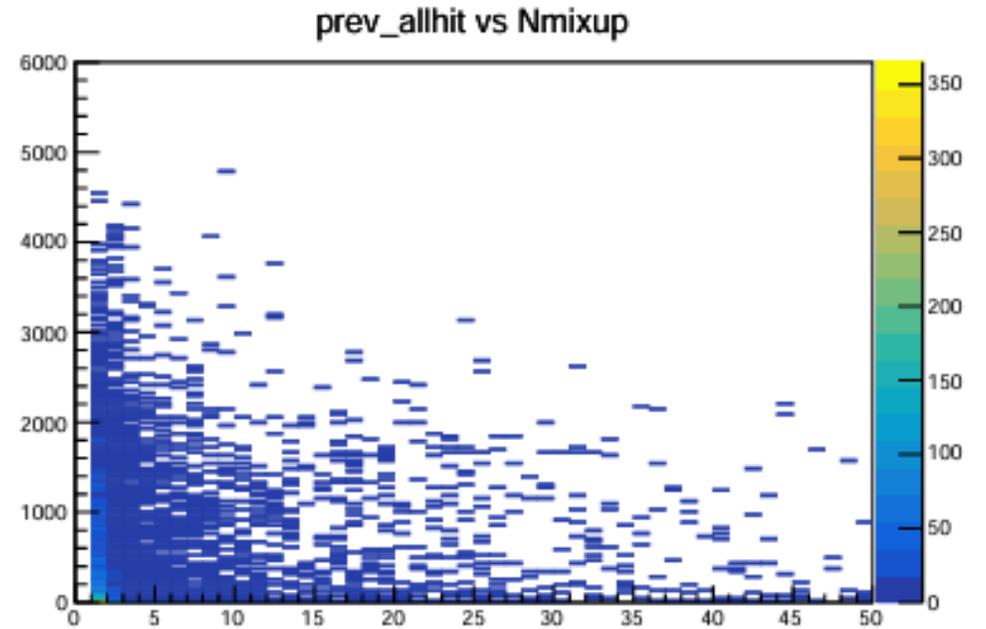
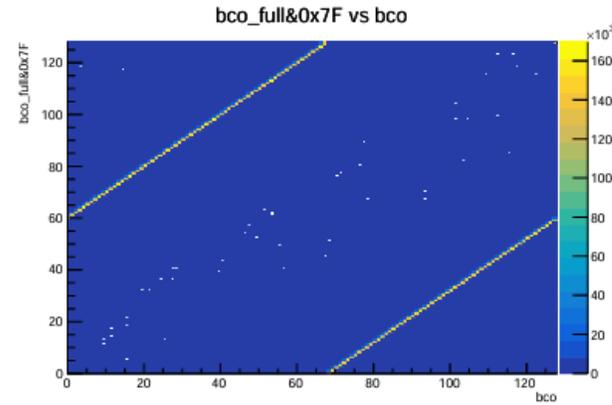
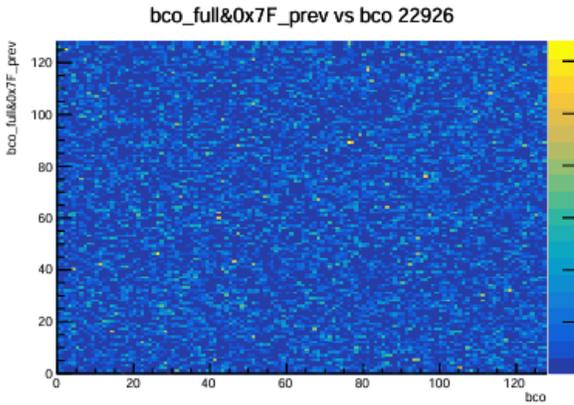
Run23896 intt6



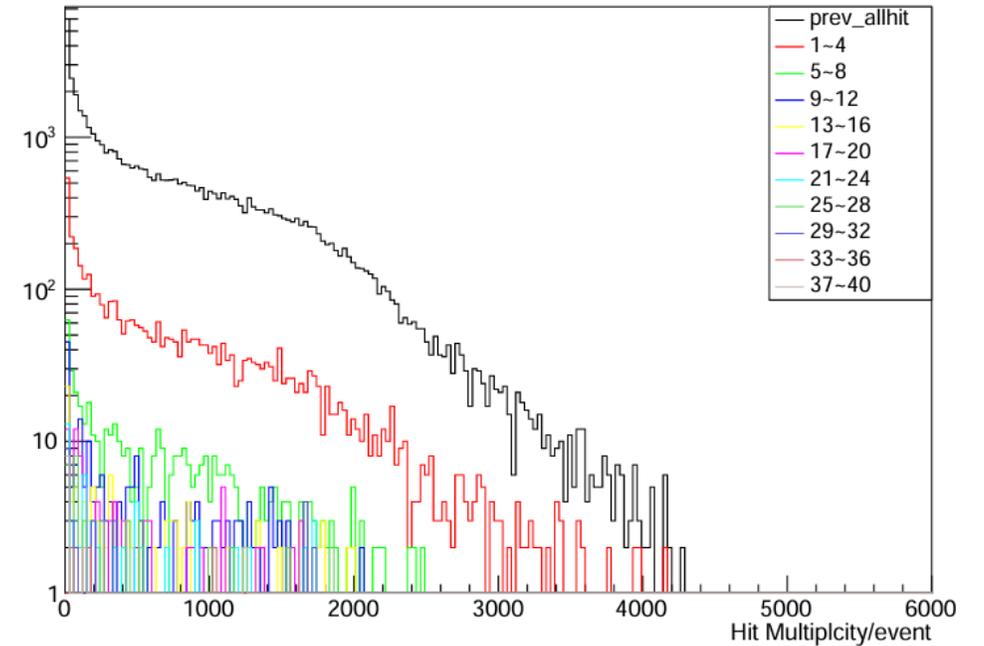
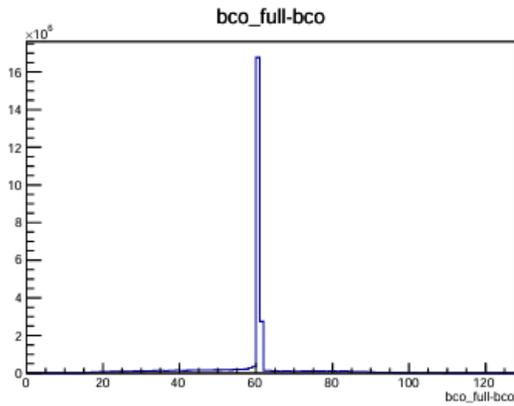
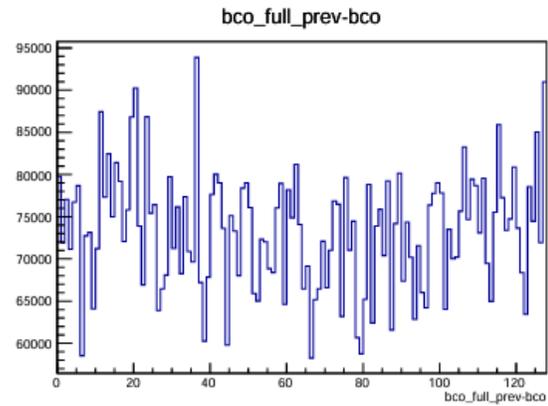
Mixup Multiplicity 23896



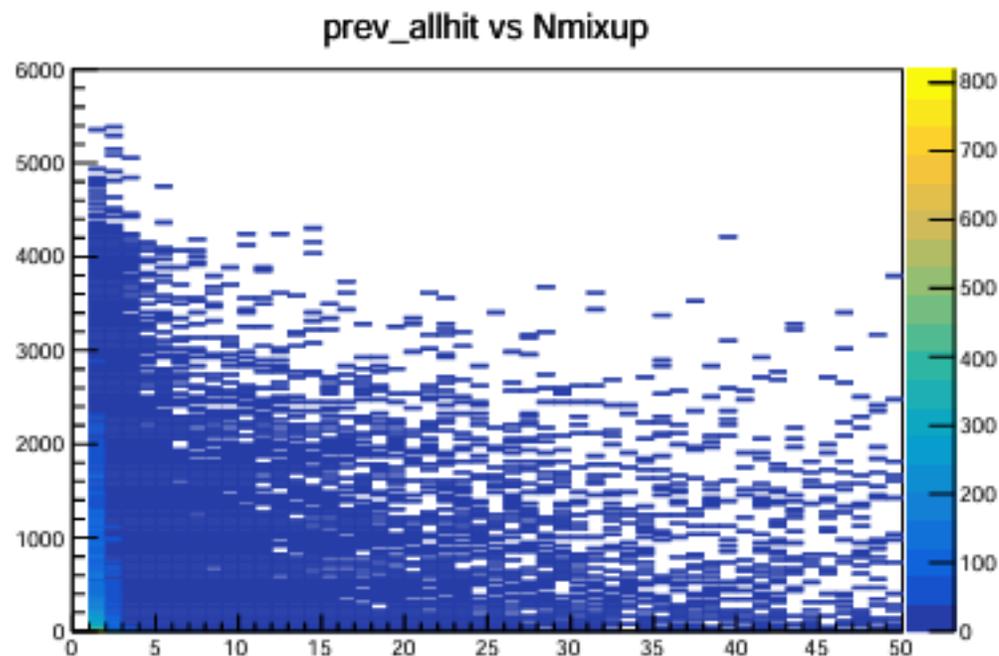
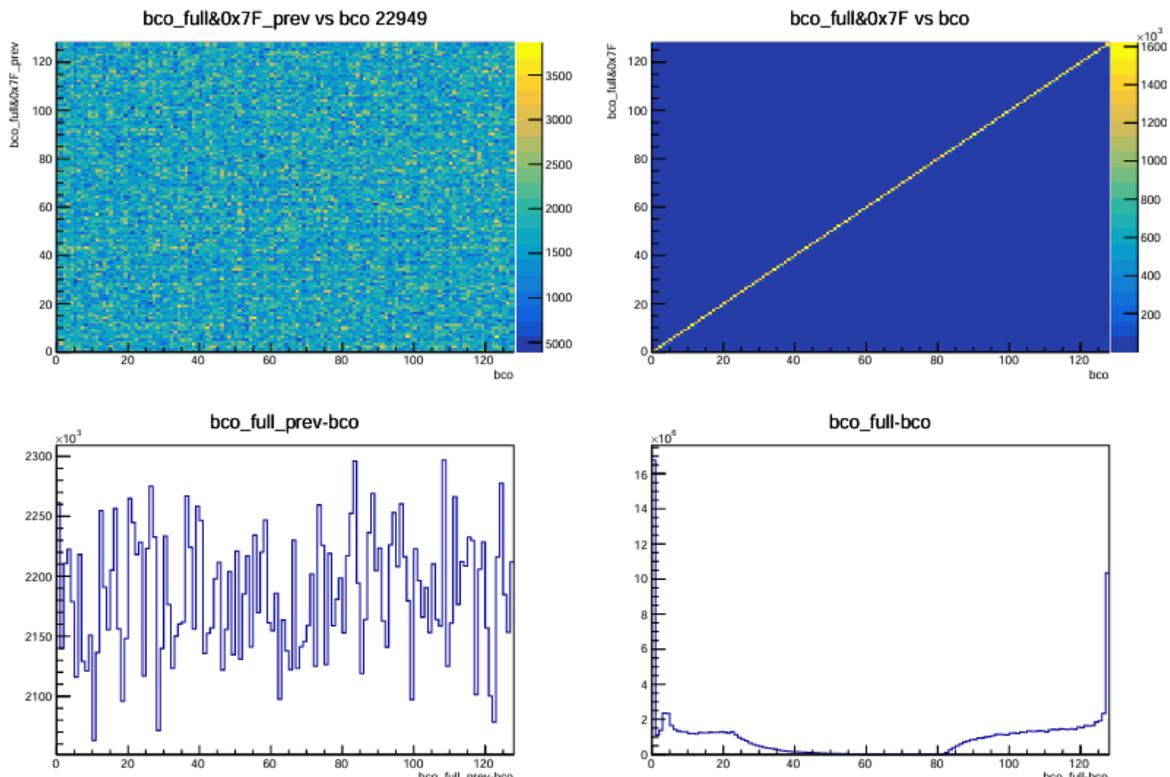
Run22926 intt7 ×



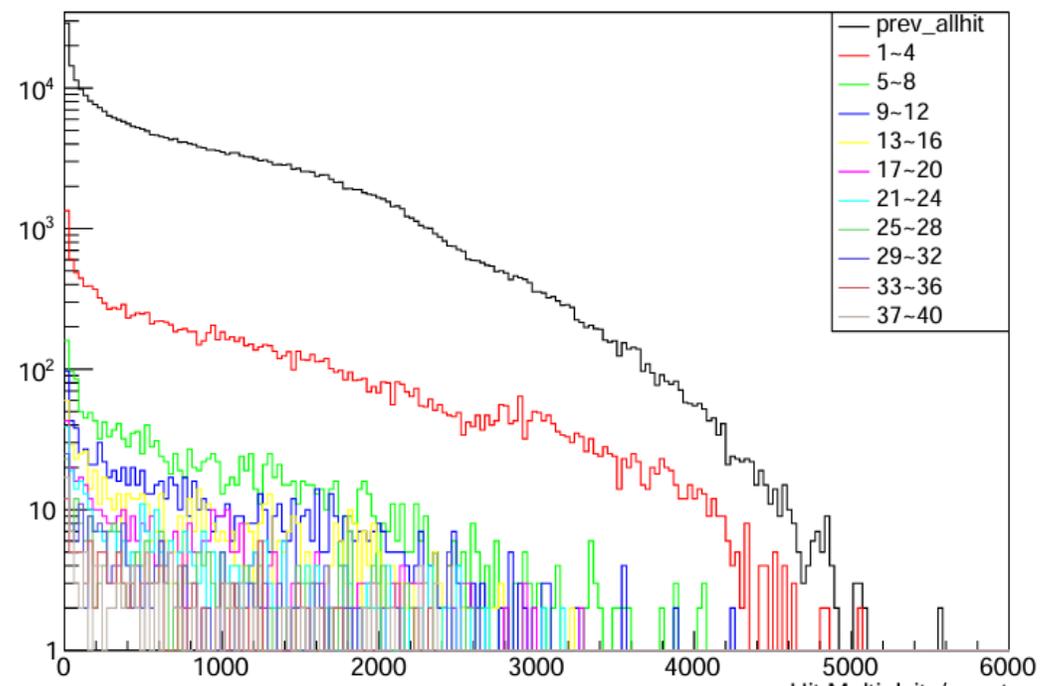
Mixup Multiplicity 22926



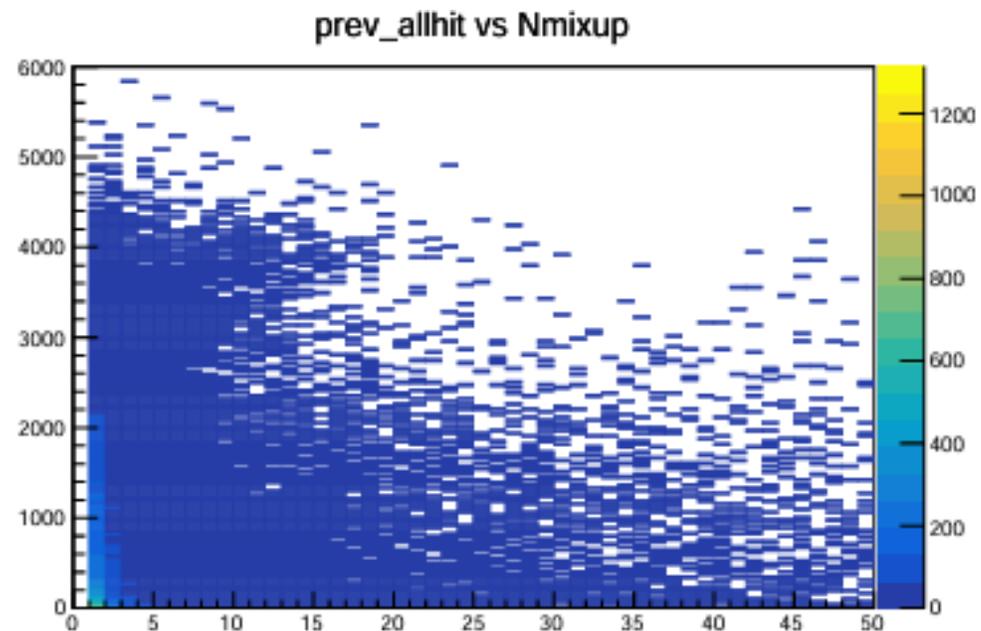
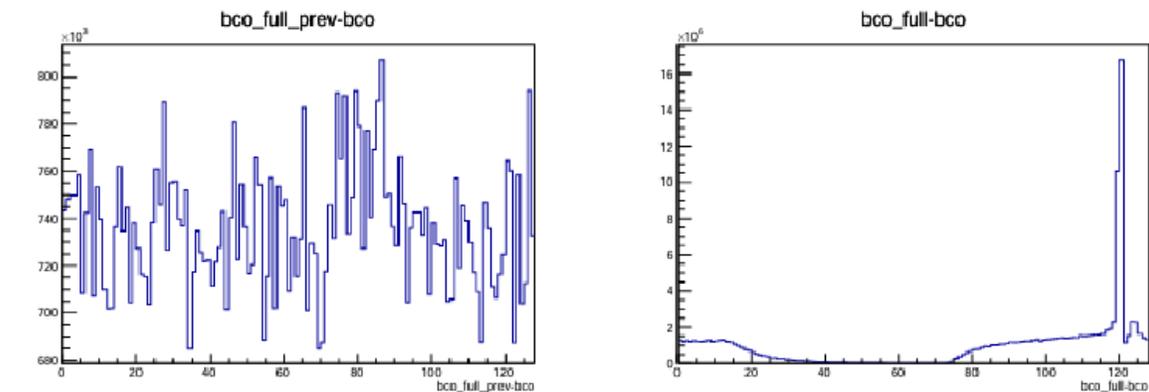
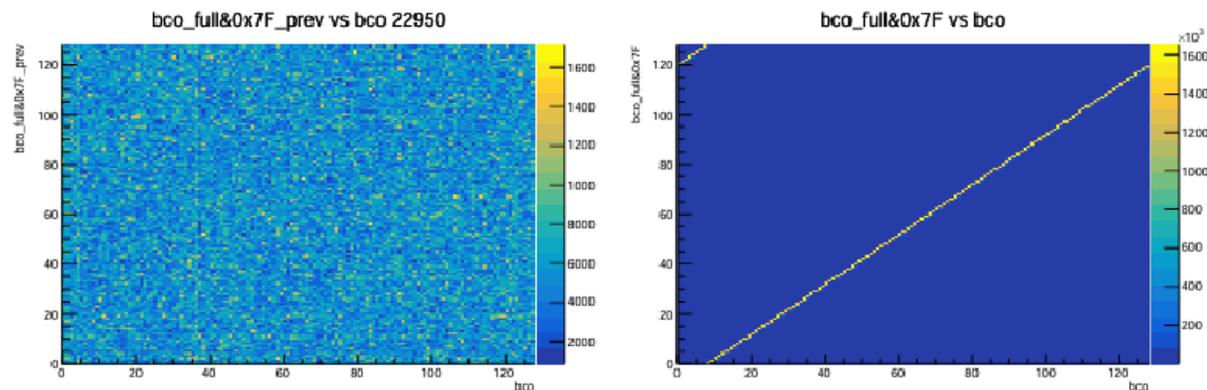
Run22949 intt7 \triangle



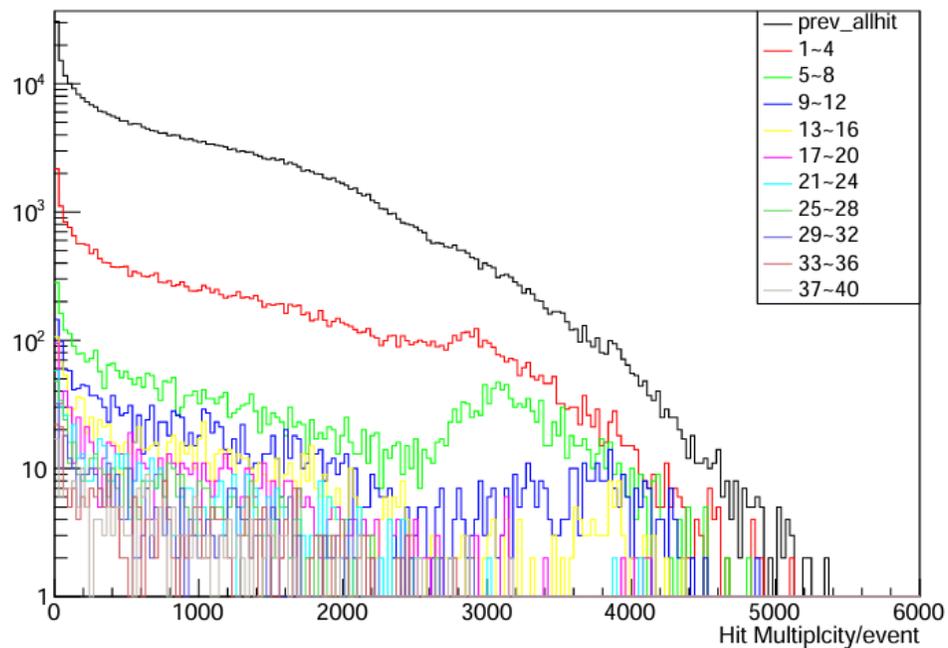
Mixup Multiplicity 22949



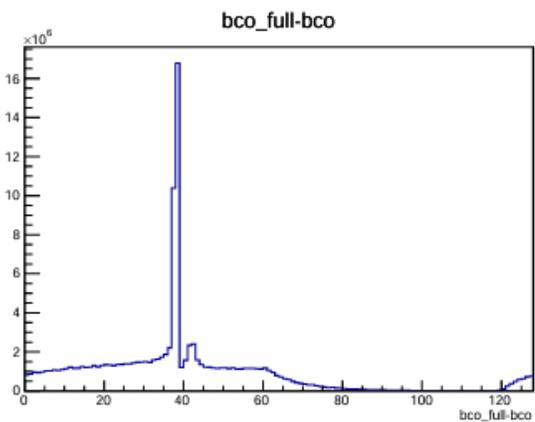
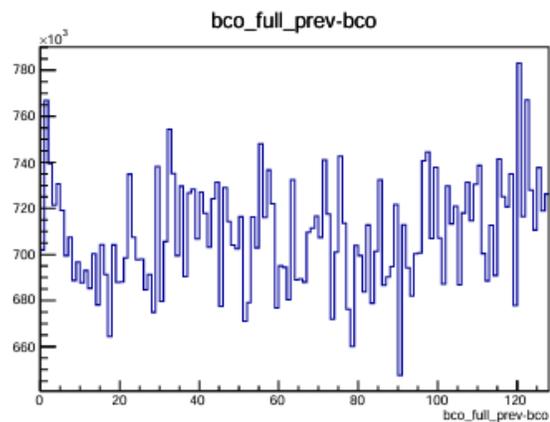
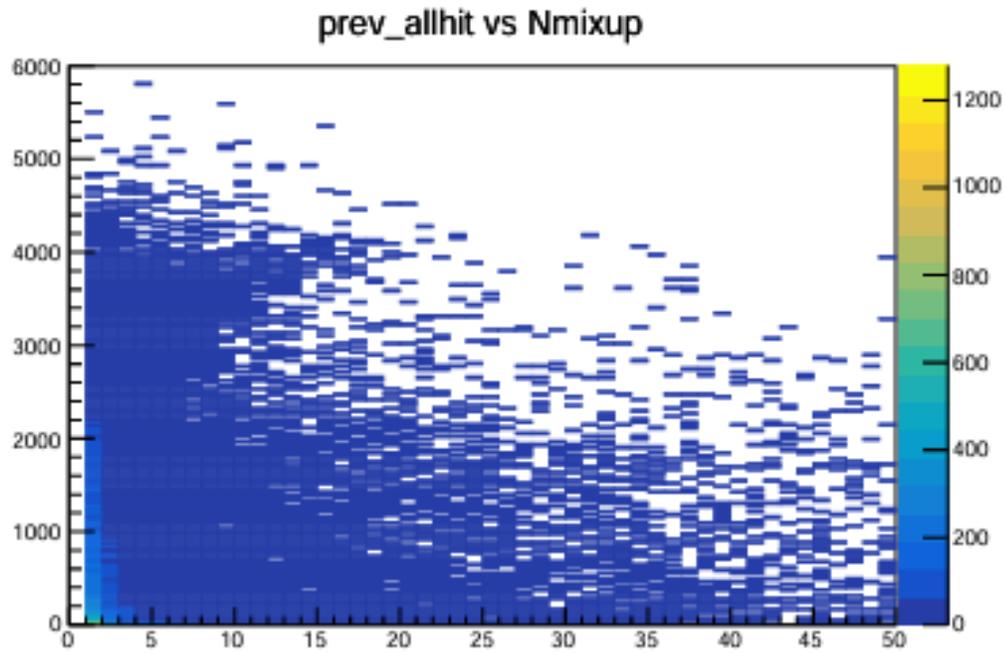
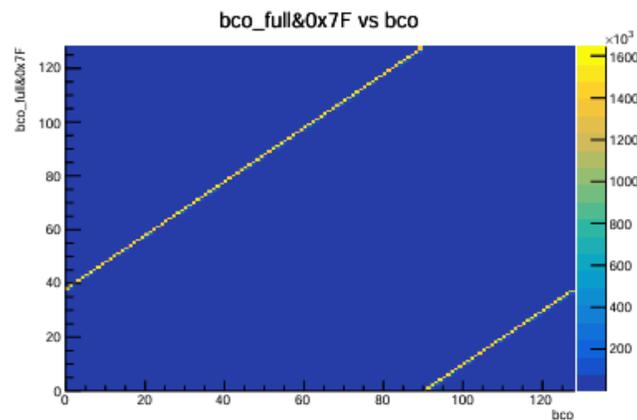
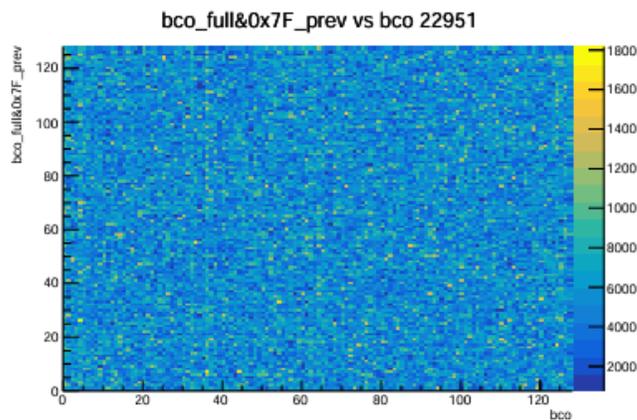
Run22950 intt7 ○



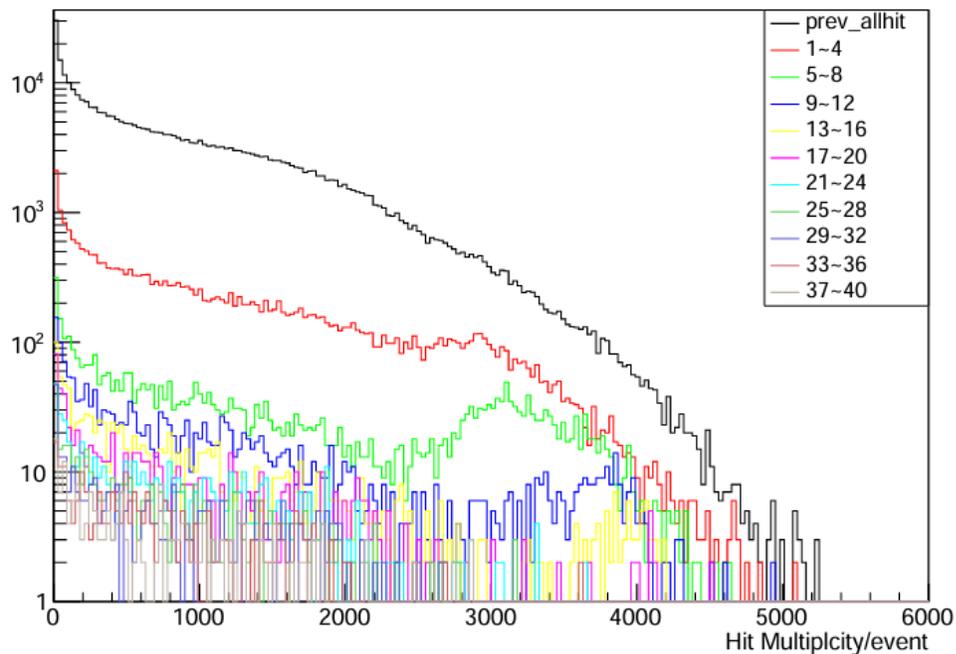
Mixup Multiplicity 22950



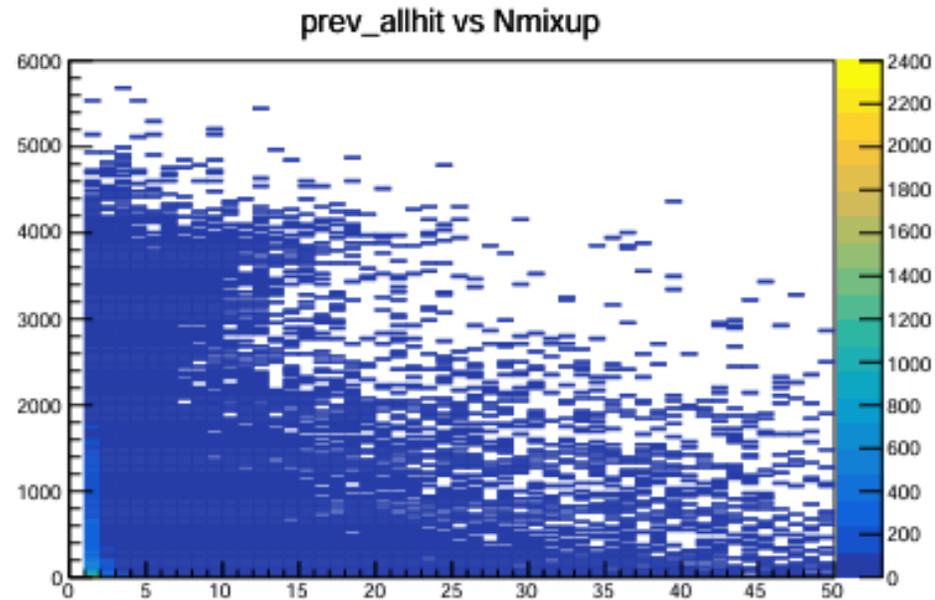
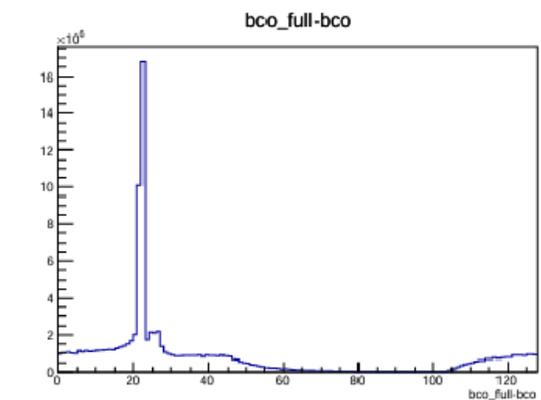
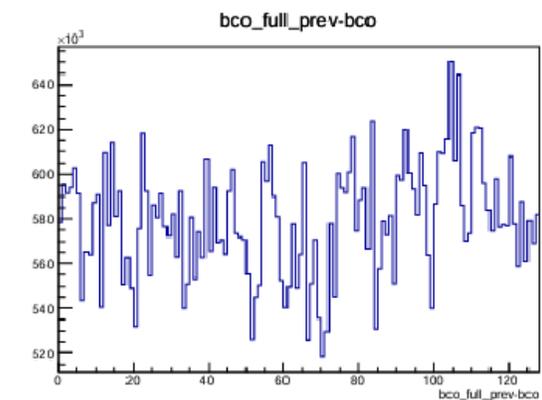
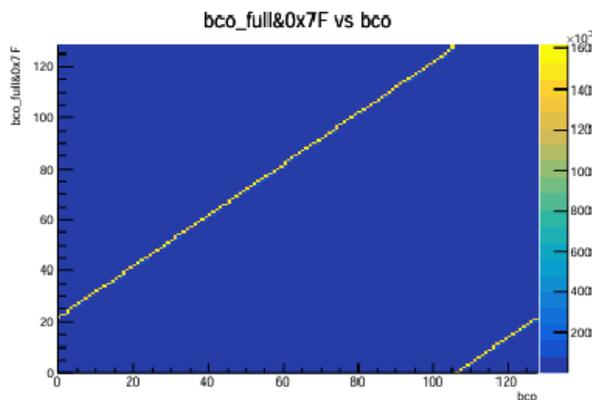
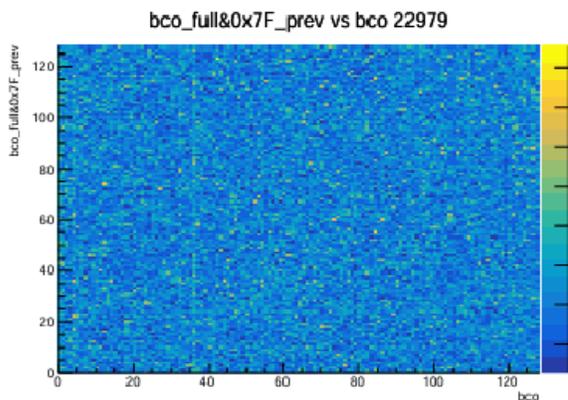
Run22951 inttt7 ○



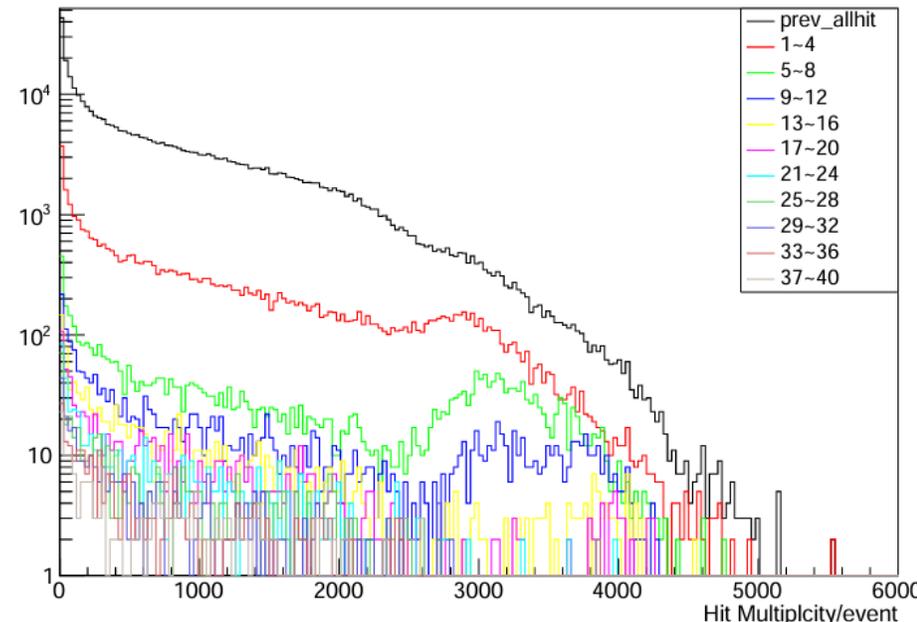
Mixup Multiplicity 22951



Run22979 intt7 ○

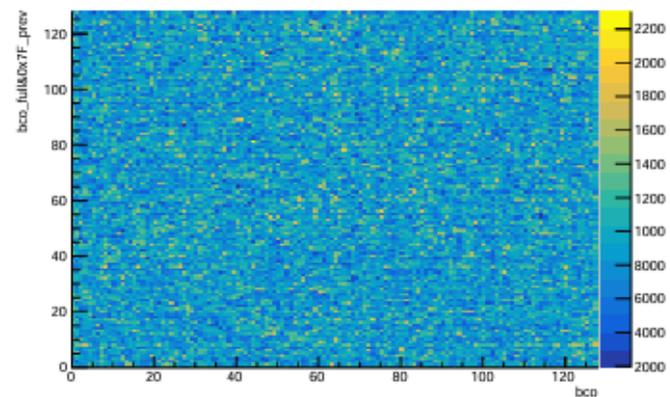


Mixup Multiplicity 22979

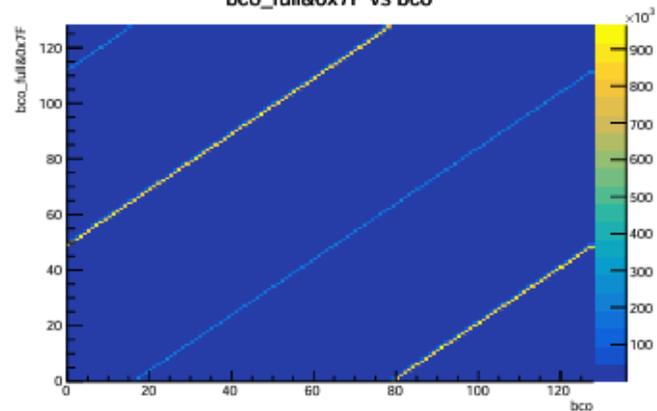


Run22986 intt7 ?

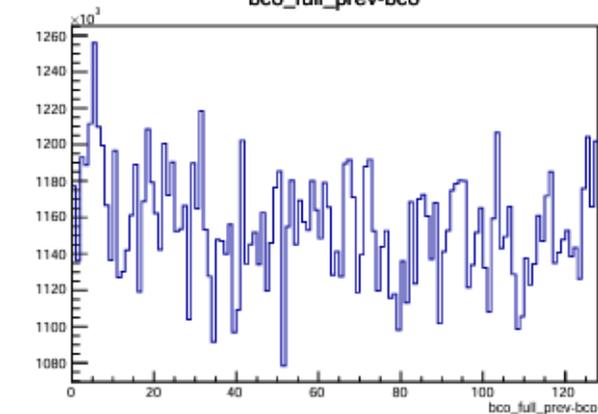
bco_full&0x7F_prev vs bco 22986



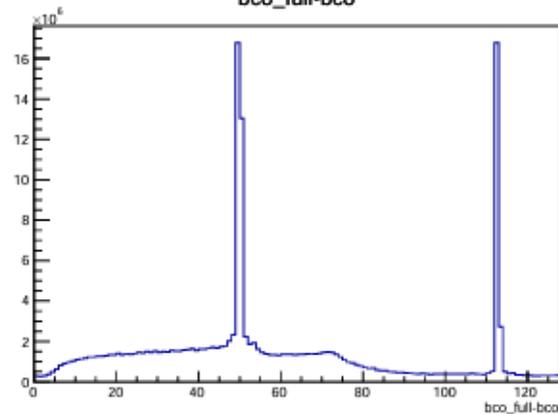
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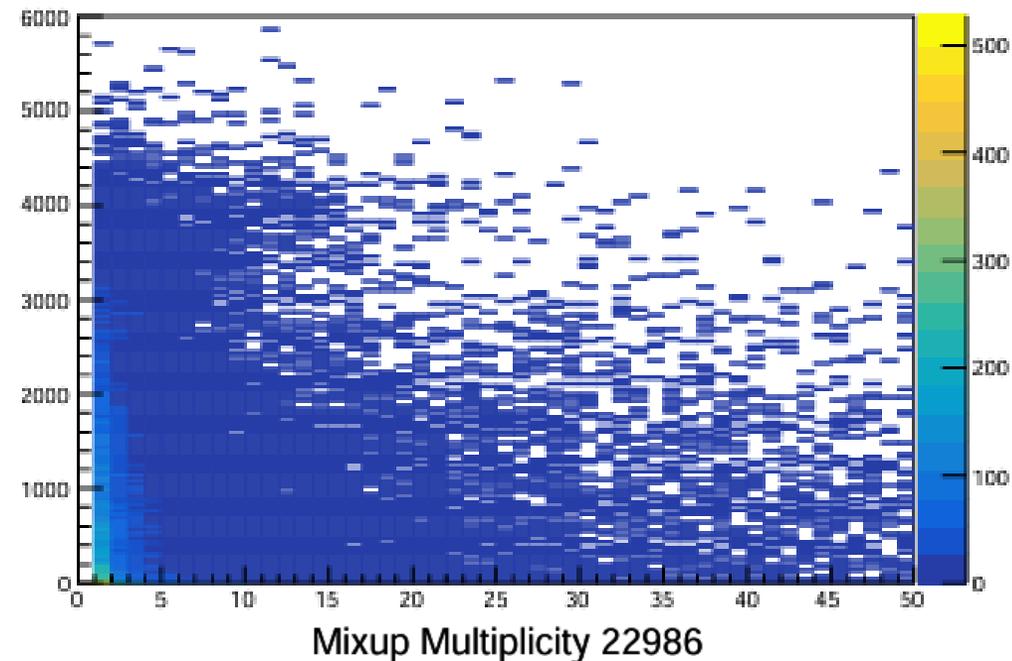
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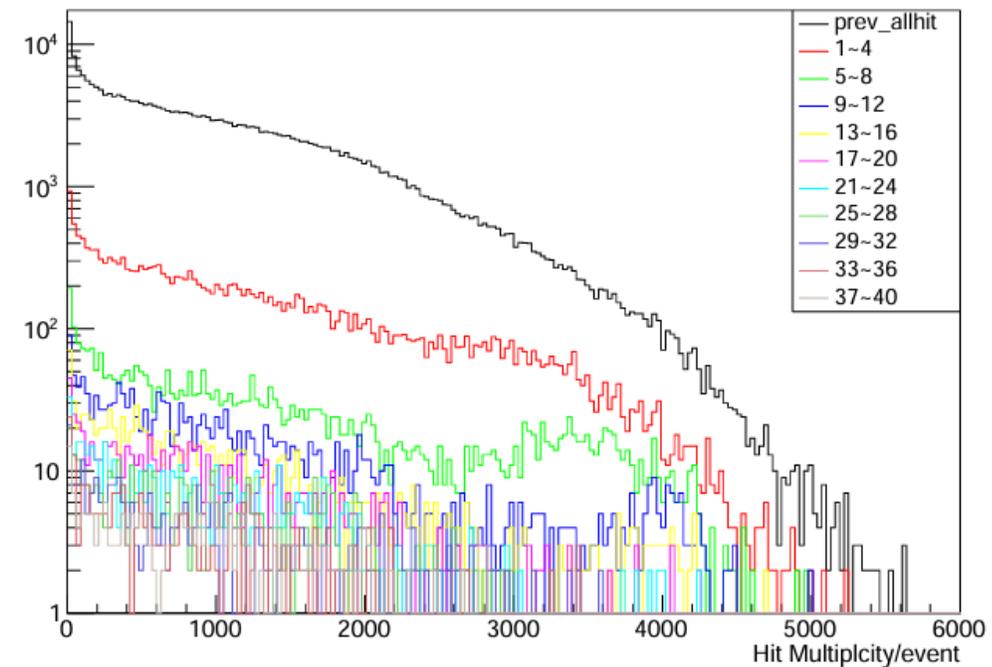
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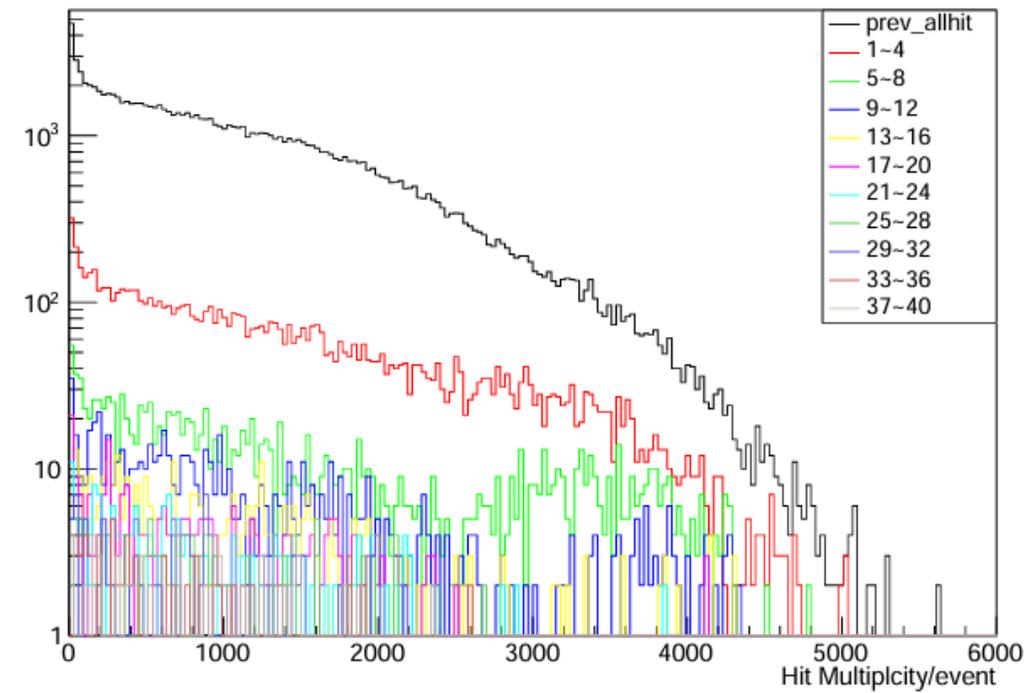
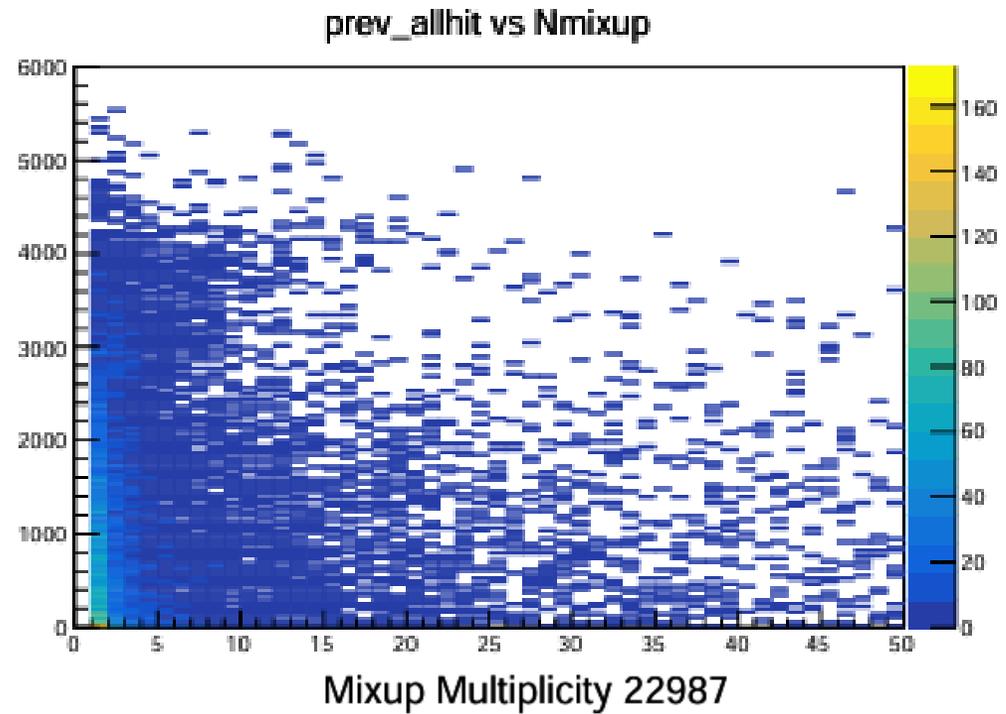
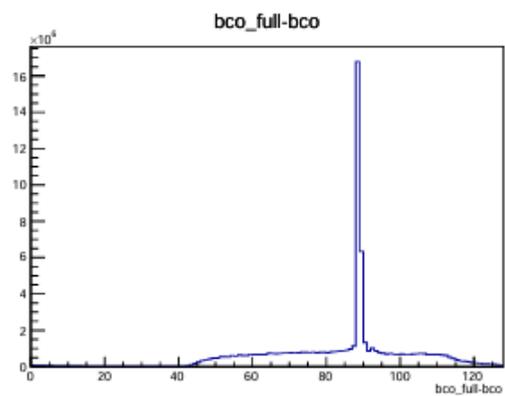
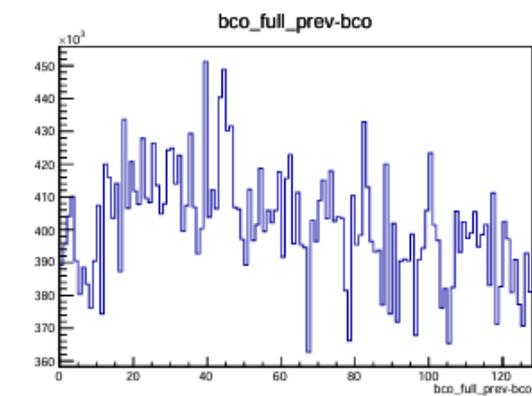
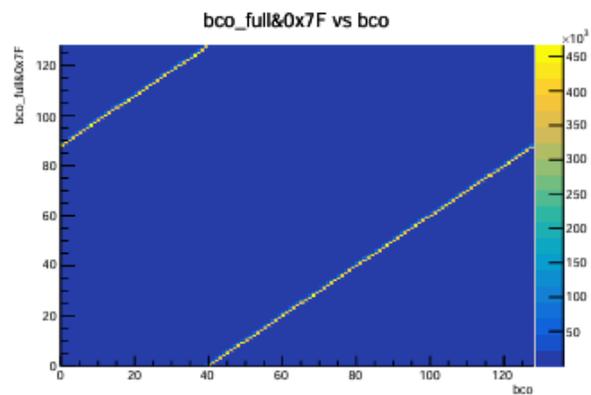
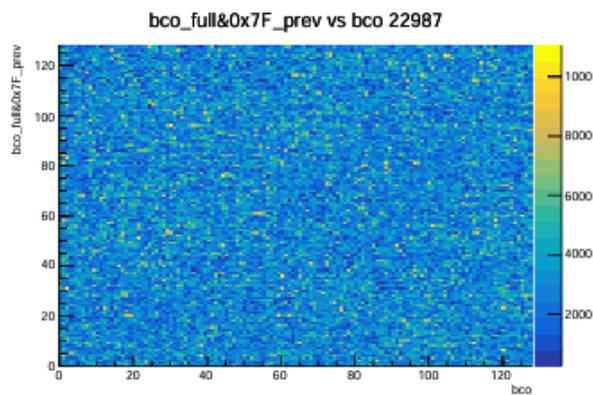
prev_allhit vs Nmixup



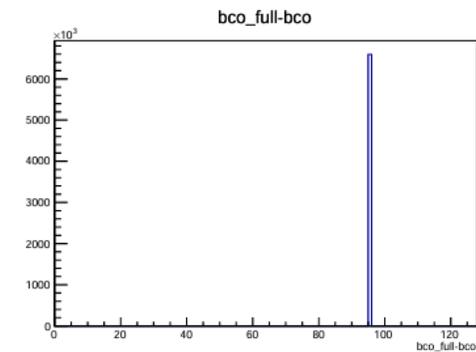
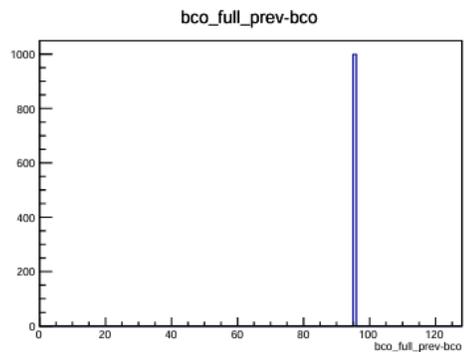
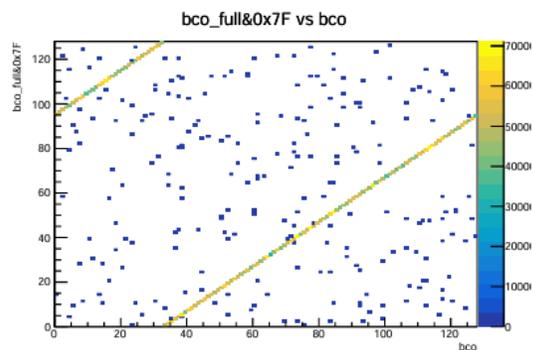
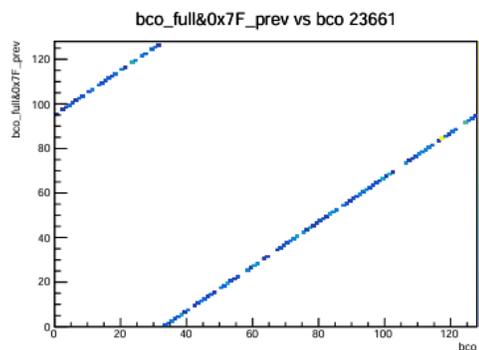
Mixup Multiplicity 22986



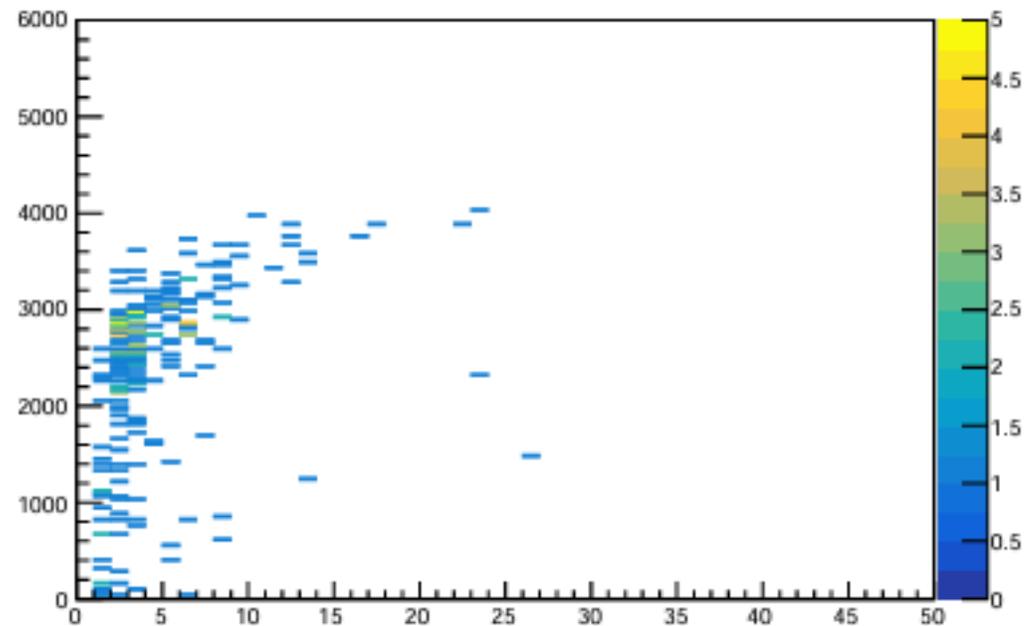
Run22987 intt7 ○



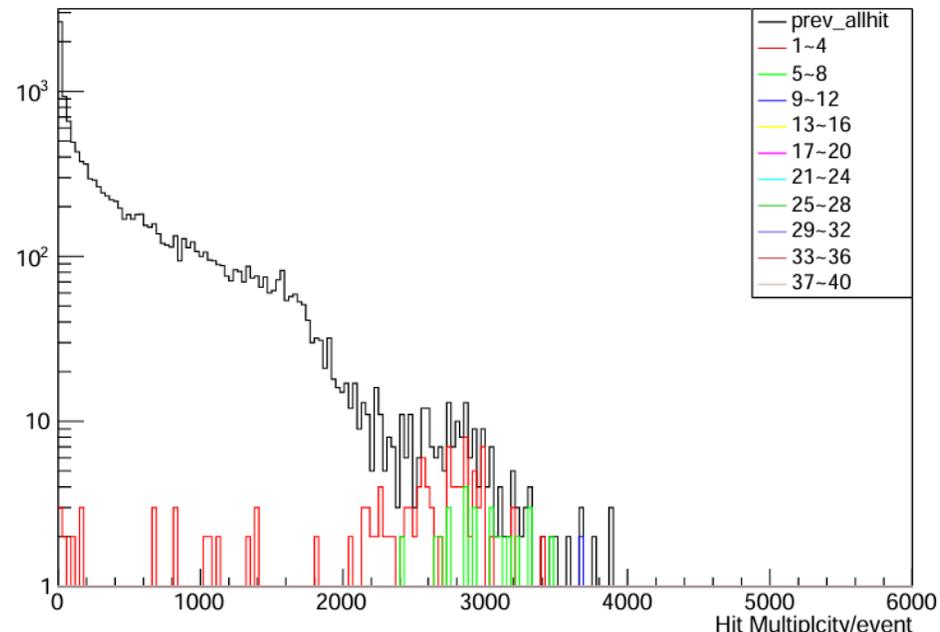
Run23661 intt7 ○



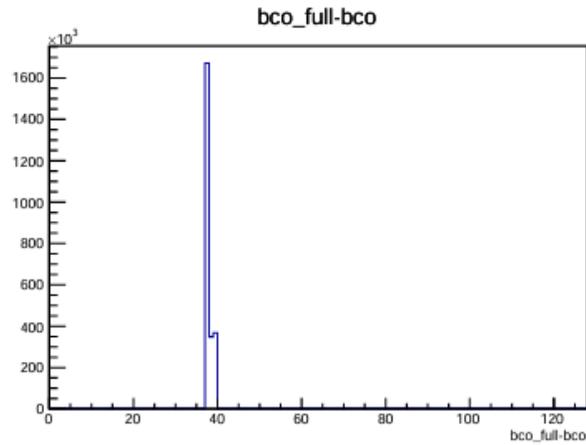
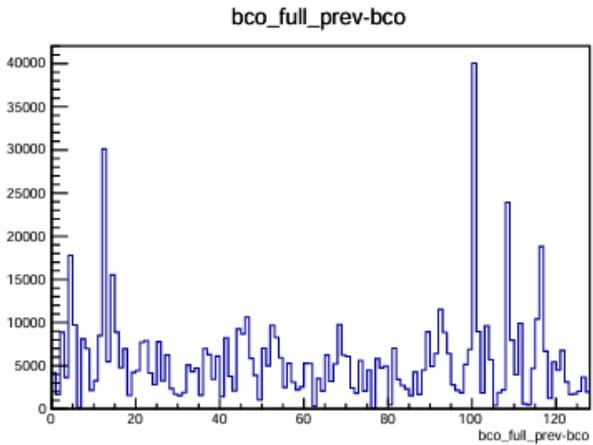
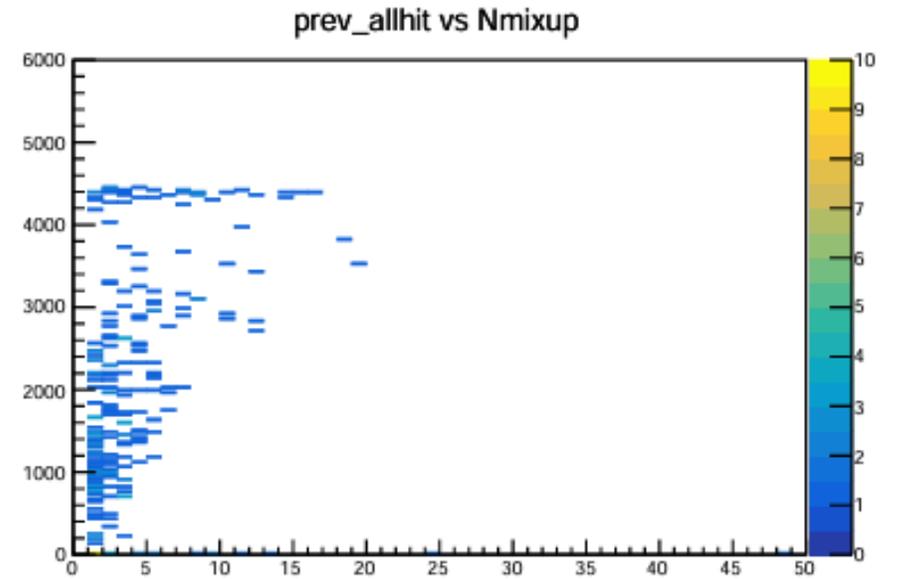
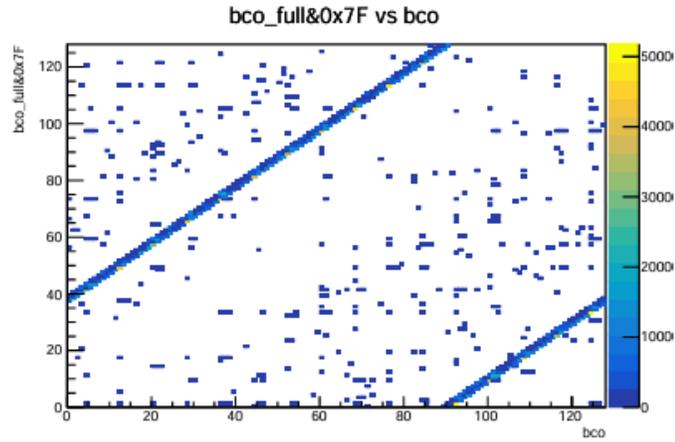
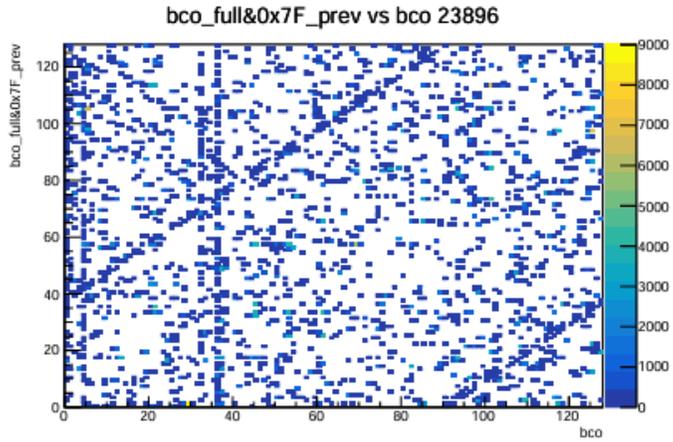
prev_allhit vs Nmixup



Mixup Multiplicity 23661



Run23896 intt7 ○



Mixup Multiplicity 23896

