Relative efficiency = $\dfrac{no.\ of\ events\ after\ all\ selections}{no.\ of\ events\ after\ all\ selections\ except\ the\ mentioned\ cut}$

2018

Mass(GeV)	HLT	Quality Control	Energy Cut	F51	dE/dx Significance
1000	0.10	0.64	0.13	0.60	1
2000	0.10	0.52	0.10	0.58	1
3000	0.11	0.59	0.09	0.70	1

Cut flow table: the number of events after the following cuts.
2018

CutFlow Mass	1000GeV	2000GeV	3000GeV
HLT	1045	1288	1342
HLT+QualityCuts	567	665	658
HLT+Quality+Energy	70	69	53
HLT+Quality+Energy+F51	42	40	37
HLT+Quality+Energy+F51+dEdXSig	42	40	37

2018 NO TRG

CutFlow Mass	1000GeV	2000GeV	3000GeV
All Events	15000	15000	15000
QualityCuts	6286	6420	6469
Quality+Energy	522	495	351
Quality+Energy+F51	435	399	343
Quality+Energy+F51+dEdXSig	435	398	341

N-1 Cut table: the no. of events after the all cuts except the mentioned cut in the left colume.

2018

N-1Cut Mass	1000GeV	2000GeV	3000GeV
No HLT	435	398	341
No QualityCuts	66	77	63
No EnergyCut	317	404	391
No F51 Cut	70	69	53
No dEdXSig Cut	42	40	37

Signal Efficiency = $\dfrac{no.\ of\ events\ after\ all\ selections}{all\ events\ before\ selections}$

2018

	1000GeV	2000GeV	3000GeV
No HLT pass	0.029	0.027	0.023

HLT pass	0.003	0.003	0.002

先放 cut flow 和 n-2 cut：有 HLT pass 的 cut 結果
在放 signal efficiency
最後放第一章 説明通過 HLT 之後的效率變低，主因是 HLT 相對效率很低

2017

Relative efficiency = $\dfrac{no.\,of\,events\,after\,all\,selections}{no.\,of\,events\,after\,all\,selections\,except\,the\,mentioned\,cut}$

2017

Mass(GeV)	HLT	Quality Control	Energy Cut	F51	dE/dx Significance
1000	0.09	0.59	0.11	0.56	1
2000	0.14	0.60	0.15	0.65	1
3000	0.08	0.55	0.08	0.52	1

Cut flow table: the number of events after the following cuts.
2017

CutFlow Mass	1000GeV	2000GeV	3000GeV
HLT	1096	1406	1356
HLT+QualityCuts	567	716	631
HLT+Quality+Energy	63	95	53
HLT+Quality+Energy+F51	35	62	27
HLT+Quality+Energy+F51+dEdXSig	35	62	27

2017 NO TRG

CutFlow Mass	1000GeV	2000GeV	3000GeV
All Events	15000	15000	15000
QualityCuts	6178	6390	6434
Quality+Energy	494	537	418
Quality+Energy+F51	408	431	332
Quality+Energy+F51+dEdXSig	408	430	332

N-1 Cut table: the no. of events after the all cuts except the mentioned cut in the left colume.
2017

N-1Cut Mass	1000GeV	2000GeV	3000GeV
No HLT	408	430	332
No QualityCuts	59	104	49
No EnergyCut	306	406	370
No F51 Cut	63	95	52
No dEdXSig Cut	35	62	27

Signal Efficiency = $\dfrac{no.\ of\ events\ after\ all\ selections}{all\ events\ before\ selections}$

2017

	1000GeV	2000GeV	3000GeV
No HLT pass	0.027	0.029	0.022
HLT pass	0.002	0.004	0.002

/////////////////////////////////////E55///

2018 CutFlow table

CutFlow Mass	1000GeV(E55 order)	1000GeV(original)
HLT	1045	1045
HLT+QualityCuts	475	567
HLT+Quality+Energy	468	70
HLT+Quality+Energy+F51	257	42
HLT+Quality+Energy+F51+dEdXSig	248	42

2018 Relative Efficiency

Mass(GeV)	HLT	Quality Control	Energy Cut	F51	dE/dx Significance
1000(e55 order)	0.08	0.59	0.98	0.55	0.96
1000(original)	0.10	0.64	0.13	0.60	1

2018 Signal Efficiency

	1000GeV(e55 order)	1000GeV(original)
No HLT pass	0.209	0.029
HLT pass	0.017	0.003

2018 CutFlow table

CutFlow ⟍ Mass	1000GeV(New)	1000GeV(original)
HLT	1045	1045
HLT+QualityCuts	893	567
HLT+Quality+Energy	729	70
HLT+Quality+Energy+F51	488	42
HLT+Quality+Energy+F51+dEdXSig	473	42
Energy cut lose %	18 %	88 %

Mass(GeV)	1000(new)	1000(orginal)
HLT	0.10	0.10
Quality Control	0.64	0.64
Energy Cut	0.83	0.13
F51	0.67	0.60
dEdx Significance	0.97	1

2018 Signal Efficiency

Mass(GeV)	1000(new)	1000(original)
No HLT pass	0.321	0.029
HLT pass	0.031	0.003

2018 CutFlow table

CutFlow / Mass(GeV)	1000	1000 (old)	2000	2000 (old)	3000	3000 (old)
HLT	1045	1045	1288	1288	1342	1342
HLT+QualityCuts	893	567	1085	665	1134	658
HLT+Quality+Energy	729	70	843	69	842	53
HLT+Quality+Energy+F51	488	42	562	40	523	37
HLT+Quality+Energy+F51+dEdXSig	473	42	553	40	503	37
Energy cut lose %	18 %	88%	22%	90%	26%	92%

2018 Relative Efficiency

Mass(GeV)	1000	1000 (old)	2000	2000 (old)	3000	3000 (old)
HLT	0.10	0.10	0.10	0.10	0.10	0.11
Quality Control	0.64	0.64	0.61	0.52	0.57	0.59
Energy Cut	0.83	0.13	0.84	0.10	0.84	0.09
F51	0.67	0.60	0.68	0.58	0.64	0.70
dEdx Significance	0.97	1.00	0.98	1.00	0.96	1.00

2018 Signal Efficiency

Mass(GeV)	1000	1000 (Old)	2000	2000 (Old)	3000	3000 (Old)
No HLT pass	0.321	0.029	0.356	0.027	0.352	0.023
HLT pass	0.031	0.003	0.037	0.003	0.034	0.002

2017 CutFlow table

CutFlow \ Mass(GeV)	1000	1000 (old)	2000	2000 (old)	3000	3000 (old)
HLT	1096	1096	1406	1406	1356	1356
HLT+QualityCuts	926	567	1174	716	1105	631
HLT+Quality+Energy	760	63	936	95	829	53
HLT+Quality+Energy+F51	490	35	599	62	495	27
HLT+Quality+Energy+F51+dEdXSig	475	35	586	62	478	27
Energy cut lose %	18 %	89%	20%	87%	25%	92%

2017 Relative Efficiency

Mass(GeV)	1000	1000 (old)	2000	2000 (old)	3000	3000 (old)
HLT	0.10	0.09	0.11	0.14	0.09	0.08
Quality Control	0.64	0.59	0.59	0.60	0.55	0.55
Energy Cut	0.82	0.11	0.83	0.15	0.83	0.08
F51	0.65	0.56	0.64	0.65	0.62	0.52
dEdx Significance	0.97	1.00	0.98	1.00	0.97	1.00

2017 Signal Efficiency

Mass(GeV)	1000	1000 (old)	2000	2000 (old)	3000	3000 (old)
No HLT pass	0.319	0.027	0.351	0.029	0.351	0.022
HLT pass	0.032	0.002	0.039	0.004	0.032	0.002

2017

no. of Monopole	1000	1000 (TRG)	2000	2000 (TRG)	3000	3000 (TRG)
1	3936	424	4285	519	4377	424
2	836	50	974	67	889	54
3	9	1	3	0	0	0

2018

no. of Monopole	1000	1000 (TRG)	2000	2000 (TRG)	3000	3000 (TRG)
1	3900	412	4344	481	4405	445
2	911	60	1000	72	877	58
3	12	1	1	0	0	0

12/9 new static
e55->pt

2018 CutFlow table

CutFlow \ Mass(GeV)	1000 (e55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
HLT	1045	1045	1288	1288	1342	1342
HLT+QualityCuts	893	893	1085	1085	1134	1134
HLT+Quality+Energy	729	700	843	809	842	815
HLT+Quality+Energy+F51	488	450	562	531	523	505
HLT+Quality+Energy+F51+dEdXSig	473	436	553	523	503	486

CutFlow \ Mass(GeV)	1000 (e55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
	14977	14977	14976	14976	14992	14992
QualityCuts	10923	10923	11165	11165	11450	11450
Quality+Energy	5775	4513	6534	5523	6676	5732
Quality+Energy+F51	4935	3849	5481	4678	5462	4747
Quality+Energy+F51+dEdXSig	4923	3765	5345	4565	5282	4601

2018 Relative Efficiency

Mass(GeV)	1000 (e55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
HLT	0.10	0.12	0.10	0.11	0.10	0.11
Quality Control	0.64	0.64	0.61	0.61	0.57	0.58
Energy Cut	0.83	0.76	0.84	0.79	0.84	0.81
F51	0.67	0.64	0.68	0.67	0.64	0.64
dEdx Significance	0.97	0.96	0.98	0.98	0.96	0.96

2018 Signal Efficiency

Mass(GeV)	1000 (e55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
No HLT pass	0.321	0.251	0.356	0.304	0.352	0.307
HLT pass	0.031	0.029	0.037	0.035	0.034	0.032

2017 CutFlow table

CutFlow	Mass(GeV)	1000 (E55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
HLT		1096	1096	1406	1406	1356	1356
HLT+QualityCuts		926	926	1174	1174	1105	1105
HLT+Quality+Energy		760	687	936	879	829	789
HLT+Quality+Energy+F51		490	434	599	552	495	465
HLT+Quality+Energy+F51+dEdXSig		475	421	586	538	478	449

2017 CutFlow table

CutFlow	Mass(GeV)	1000 (E55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
No TRG, No CUTS		14982	14982	14984	14984	14986	14986
QualityCuts		10955	10955	11122	11122	11447	11447
Quality+Energy		5713	4353	6415	5440	6673	5693
Quality+Energy+F51		4885	3731	5391	4604	5440	4700
Quality+Energy+F51+dEdXSig		4781	3649	5262	4510	5266	4566

$$\text{Relative efficiency} = \frac{no.\,of\,events\,after\,all\,selections}{no.\,of\,events\,after\,all\,selections\,except\,the\,mentioned\,cut}$$

2017 Relative Efficiency

Mass(GeV)	1000 (e55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (pT)
HLT	0.10	0.12	0.11	0.12	0.09	0.10
Quality Control	0.64	0.63	0.59	0.59	0.55	0.54
Energy Cut	0.82	0.72	0.83	0.77	0.83	0.77
F51	0.65	0.63	0.64	0.63	0.62	0.61
dEdx Significance	0.97	0.97	0.98	0.97	0.97	0.96

$$\text{Signal Efficiency} = \frac{no.\,of\,events\,after\,all\,selections}{all\,events\,before\,selections}$$

2017 Signal Efficiency

Mass(GeV)	1000 (e55)	1000 (pT)	2000 (e55)	2000 (pT)	3000 (e55)	3000 (old)
No HLT pass	0.319	0.243	0.351	0.301	0.351	0.304
HLT pass	0.032	0.028	0.039	0.036	0.032	0.030

2017

no. of Monopole	1000	1000 (TRG)	2000	2000 (TRG)	3000	3000 (TRG)
1	2936	379	3633	481	3798	429
2	706	41	874	57	803	57
3	7	1	3	0	0	0

2018

no. of Monopole	1000	1000 (TRG)	2000	2000 (TRG)	3000	3000 (TRG)
1	2986	389	3666	456	3748	399
2	768	46	898	67	818	50
3	11	1	1	0	0	0

Relative efficiency =
$$\frac{no.\,of\,events\,after\,all\,selections}{no.\,of\,events\,after\,all\,selections\,except\,the\,mentioned\,cut}$$

Signal Efficiency =
$$\frac{no.\,of\,events\,after\,all\,selections}{all\,events\,before\,selections}$$

Trigger Efficiency =
$$\frac{all\,events\,after\,selection + Trigger}{all\,events\,after\,selections}$$

trg efficiency 這樣算可以ㄇ

	avg prescale (2017)	Trigger efficiency	trg / total evt
Photon175	X	0.123	0.08728
PFMET170_NotCleaned	~4	0.362	0.29549
PFMET170_NoiseCleaned	4.6	0.322	0.2692
PFMET170_JetIdCleaned	4.6	0.323	0.26928
PFMET170_BeamHaloCleaned	5.5	0.361	0.29401
PFMET170_HBHECleaned	X	0.361	0.2952
PFMET170_HBHE_BeamHaloCleaned	1.6	0.360	0.29372
OR (Photon175‖ PFMET170_NotCleaned)		0.380	0.31414
NoTRG		1	

Cut Flow table (Total event: 100,000)

	TRG	TRG +Quality	TRG +Quality +Pt	TRG +Quality +Pt +f51	TRG +Quality +Pt +f51 +dEdxSig
Photon175	8787	7240	5408	3587	3516
PFMET170_NotCleaned	29549	23379	12979	10545	10346
PFMET170_NoiseCleaned	26920	21466	11705	9382	9214
PFMET170_JetIdCleaned	26928	21471	11710	9387	9219
PFMET170_BeamHaloCleaned	29401	23279	12935	10509	10311
PFMET170_HBHECleaned	29520	23359	12960	10528	10329
PFMET170_HBHE_BeamHaloCleaned	29372	23259	12916	10492	10294
OR (Photon175‖PFMET170_NotCleaned)	31414	24879	14007	11041	10830
NoTRG	99812	69345	33435	29008	28576

説明使用 MET 的理由：因為 monopole 與 detector 反應的能量異常高，可能成為造成 missing energy
eff 結果和舊的比較: 175
有沒有可能漏掉什麼？ 例如 MET 真的可能殺掉一些 monopole?
有無 trg 最後 cut 完數字應該要接近才對?
為什麼當初要放棄 MET? 找 met 刪掉 spike 的資料

	Photon175	PFMET170 _NotCleaned	PFMET170 _NoiseCleaned	OR	NoTRG
No TRG	28542	28542	28542	29542	28576
No Quality	5500	15446	13766	16248	40467
No Pt	4660	15550	14028	16324	49011
No f51	5279	12635	11389	13642	32869
No dEdxSig	3571	10517	9351	11011	29008