Cut	Count	Efficiency (%)
No cut	3255	
E_{EM} cut	3162	$97.14^{+0.29}_{-0.34}$
E_{HAD} cut	3190	$98.00^{+0.25}_{-0.29}$
COT hits cut	3255	$100.00^{+0.00}_{-0.06}$
d_0 cut	3239	$99.51^{+0.11}_{-0.16}$
Isolation cut	3075	$94.47^{+0.38}_{-0.45}$
Δx_{CMU} cut	3246	$99.72^{+0.09}_{-0.12}$
Δx_{CMP} cut	3187	$97.91^{+0.26}_{-0.28}$
All above cuts	2860	$87.86^{+0.56}_{-0.61}$
All cuts excl. isol.	3015	$92.63^{+0.46}_{-0.46}$
Sliding isol. cut	3137	$96.37^{+0.33}_{-0.35}$
All cuts (sliding isol.)	2916	$89.59^{+0.53}_{-0.55}$
χ^2 cut	3255	$100.00^{+0.00}_{-0.06}$
All cuts (χ^2)	2860	$87.86^{+0.56}_{-0.61}$
All track cuts	2925	$89.86^{+0.54}_{-0.58}$
All trk cuts excl. isol.	3086	$94.81^{+0.38}_{-0.40}$

TABLE I: Dataset bhmummP28: Muon ID efficiencies for CMUP

Cut	Count	Efficiency (%)
No cut	2199	
E_{EM} cut	2114	$96.13^{+0.42}_{-0.46}$
E_{HAD} cut	2161	$98.27^{+0.29}_{-0.35}$
COT hits cut	2198	$99.95^{+0.04}_{-0.10}$
d_0 cut	2191	$99.64^{+0.13}_{-0.19}$
Isolation cut	2088	$94.95^{+0.48}_{-0.49}$
Δx_{CMX} cut	2195	$99.82^{+0.09}_{-0.14}$
All above cuts	1966	$89.40^{+0.68}_{-0.68}$
All cuts excl. isol.	2065	$93.91^{+0.50}_{-0.57}$
Sliding isol. cut	2132	$96.95^{+0.39}_{-0.40}$
All cuts (sliding isol.)	2009	$91.36^{+0.58}_{-0.69}$
χ^2 cut	2199	$100.00^{+0.00}_{-0.08}$
All cuts (χ^2)	1966	$89.40^{+0.68}_{-0.68}$
All track cuts	1969	$89.54^{+0.64}_{-0.72}$
All trk cuts excl. isol.	2069	$94.09^{+0.52}_{-0.56}$

TABLE II: Dataset bhmummP28: Muon ID efficiencies for CMX

Cut	Count	Efficiency (%)
No cut	1746	
E_{EM} cut	1679	$96.16^{+0.44}_{-0.53}$
E_{HAD} cut	1715	$98.22^{+0.34}_{-0.40}$
COT hits cut	1746	$100.00^{+0.00}_{-0.11}$
d_0 cut	1741	$99.71^{+0.13}_{-0.19}$
Isolation cut	1666	$95.42^{+0.50}_{-0.57}$
Δx_{CMX} cut	1742	$99.77^{+0.11}_{-0.18}$
All above cuts	1568	$89.81^{+0.77}_{-0.79}$
All cuts excl. isol.	1641	$93.99^{+0.59}_{-0.58}$
Sliding isol. cut	1699	$97.31^{+0.37}_{-0.46}$
All cuts (sliding isol.)	1600	$91.64^{+0.70}_{-0.67}$
χ^2 cut	1746	$100.00^{+0.00}_{-0.11}$
All cuts (χ^2)	1568	$89.81^{+0.77}_{-0.79}$
All track cuts	1571	$89.98^{+0.70}_{-0.77}$
All trk cuts excl. isol.	1645	$94.22^{+0.56}_{-0.61}$

TABLE III: Dataset bhmummP28: Muon ID efficiencies for CMX Arches

Cut	Count	Efficiency (%)
No cut	378	
E_{EM} cut	361	$95.50^{+1.08}_{-1.26}$
E_{HAD} cut	373	$98.68^{+0.59}_{-0.87}$
COT hits cut	377	$99.74^{+0.24}_{-0.59}$
d_0 cut	376	$99.47^{+0.36}_{-0.72}$
Isolation cut	350	$92.59^{+1.45}_{-1.67}$
Δx_{CMX} cut	378	$100.00^{+0.00}_{-0.49}$
All above cuts	330	$87.30^{+1.66}_{-2.05}$
All cuts excl. isol.	353	$93.39^{+1.24}_{-1.49}$
Sliding isol. cut	359	$94.97^{+1.22}_{-1.32}$
All cuts (sliding isol.)	339	$89.68^{+1.63}_{-1.89}$
χ^2 cut	378	$100.00^{+0.00}_{-0.49}$
All cuts (χ^2)	330	$87.30^{+1.66}_{-2.05}$
All track cuts	330	$87.30^{+1.66}_{-2.05}$
All trk cuts excl. isol.	353	$93.39^{+1.24}_{-1.49}$

TABLE IV: Dataset bhmummP28: Muon ID efficiencies for CMX Miniskirt

Cut	Count	Efficiency (%)
No cut	75	
E_{EM} cut	74	$98.67^{+1.04}_{-3.06}$
E_{HAD} cut	73	$97.33^{+1.79}_{-3.49}$
COT hits cut	75	$100.00^{+0.00}_{-2.43}$
d_0 cut	74	$98.67^{+1.04}_{-3.06}$
Isolation cut	72	$96.00^{+2.24}_{-3.62}$
Δx_{CMX} cut	75	$100.00^{+0.00}_{-2.43}$
All above cuts	68	$90.67^{+3.28}_{-4.53}$
All cuts excl. isol.	71	$94.67^{+2.40}_{-3.85}$
Sliding isol. cut	74	$98.67^{+1.04}_{-3.06}$
All cuts (sliding isol.)	70	$93.33^{+2.96}_{-4.08}$
χ^2 cut	75	$100.00^{+0.00}_{-2.43}$
All cuts (χ^2)	68	$90.67^{+3.28}_{-4.53}$
All track cuts	68	$90.67^{+3.28}_{-4.53}$
All trk cuts excl. isol.	71	$94.67^{+2.40}_{-3.85}$

TABLE V: Dataset bhmummP28: Muon ID efficiencies for CMX Keystone

Cut	Count	Efficiency (%)
No cut	453	
E_{EM} cut	435	$96.03^{+0.90}_{-1.15}$
E_{HAD} cut	446	$98.45^{+0.52}_{-0.85}$
COT hits cut	452	$99.78^{+0.18}_{-0.50}$
d_0 cut	450	$99.34^{+0.34}_{-0.63}$
Isolation cut	422	$93.16^{+1.28}_{-1.46}$
Δx_{CMX} cut	453	$100.00^{+0.00}_{-0.41}$
All above cuts	398	$87.86^{+1.50}_{-1.82}$
All cuts excl. isol.	424	$93.60^{+1.23}_{-1.31}$
Sliding isol. cut	433	$95.58^{+0.95}_{-1.20}$
All cuts (sliding isol.)	409	$90.29^{+1.41}_{-1.52}$
χ^2 cut	453	$100.00^{+0.00}_{-0.41}$
All cuts (χ^2)	398	$87.86^{+1.50}_{-1.82}$
All track cuts	398	$87.86^{+1.50}_{-1.82}$
All trk cuts excl. isol.	424	$93.60^{+1.23}_{-1.31}$

TABLE VI: Dataset bhmummP28: Muon ID efficiencies for MiniKey

Cut	Count	Efficiency (%)
No cut	802	
E_{EM} cut	770	$96.01^{+0.72}_{-0.84}$
E_{HAD} cut	782	$97.51^{+0.59}_{-0.68}$
COT hits cut	802	$100.00^{+0.00}_{-0.23}$
d_0 cut	798	$99.50^{+0.23}_{-0.40}$
Isolation cut	767	$95.64^{+0.70}_{-0.86}$
Δx_{CMU} cut	801	$99.88^{+0.11}_{-0.28}$
All above cuts	716	$89.28^{+1.06}_{-1.24}$
All cuts excl. isol.	748	$93.27^{+0.92}_{-1.03}$
Sliding isol. cut	779	$97.13^{+0.57}_{-0.70}$
All cuts (sliding isol.)	728	$90.77^{+1.07}_{-1.17}$
χ^2 cut	802	$100.00^{+0.00}_{-0.23}$
All cuts (χ^2)	716	$89.28^{+1.06}_{-1.24}$
All track cuts	717	$89.40^{+1.13}_{-1.17}$
All trk cuts excl. isol.	749	$93.39^{+0.90}_{-0.96}$

TABLE VII: Dataset bhmummP28: Muon ID efficiencies for CMU-only

Cut	Count	Efficiency (%)
No cut	891	
E_{EM} cut	873	$97.98^{+0.48}_{-0.59}$
E_{HAD} cut	878	$98.54^{+0.41}_{-0.52}$
COT hits cut	891	$100.00^{+0.00}_{-0.21}$
d_0 cut	890	$99.89^{+0.09}_{-0.26}$
Isolation cut	843	$94.61^{+0.75}_{-0.91}$
Δx_{CMP} cut	869	$97.53^{+0.56}_{-0.61}$
All above cuts	791	$88.78^{+1.12}_{-1.13}$
All cuts excl. isol.	837	$93.94^{+0.84}_{-0.92}$
Sliding isol. cut	854	$95.85^{+0.69}_{-0.78}$
All cuts (sliding isol.)	801	$89.90^{+1.07}_{-1.08}$
χ^2 cut	891	$100.00^{+0.00}_{-0.21}$
All cuts (χ^2)	791	$88.78^{+1.12}_{-1.13}$
All track cuts	812	$91.13^{+1.01}_{-1.05}$
All trk cuts excl. isol.	859	$96.41^{+0.61}_{-0.75}$

TABLE VIII: Dataset bhmummP28: Muon ID efficiencies for CMP-only

Cut	Count	Efficiency (%)
No cut	862	
E_{EM} cut	838	$97.22^{+0.59}_{-0.68}$
E_{HAD} cut	844	$97.91^{+0.50}_{-0.62}$
COT hits cut	857	$99.42^{+0.26}_{-0.37}$
d_0 cut	857	$99.42^{+0.26}_{-0.37}$
Isolation cut	819	$95.01^{+0.74}_{-0.82}$
Min E cut	832	$96.52^{+0.60}_{-0.77}$
All above cuts	759	$88.05^{+1.11}_{-1.19}$
All cuts excl. isol.	788	$91.42^{+0.92}_{-1.03}$
Sliding isol. cut	830	$96.29^{+0.64}_{-0.73}$
All cuts (sliding isol.)	768	$89.10^{+1.09}_{-1.16}$
χ^2 cut	862	$100.00^{+0.00}_{-0.21}$
All cuts (χ^2)	759	$88.05^{+1.11}_{-1.19}$

TABLE IX: Dataset bhmummP28: Muon ID efficiencies for CMIO

Cut	Count	Efficiency (%)
No cut	661	
E_{EM} cut	639	$96.67^{+0.74}_{-0.82}$
E_{HAD} cut	626	$94.70^{+0.85}_{-1.00}$
COT hits cut	656	$99.24^{+0.34}_{-0.49}$
d_0 cut	654	$98.94^{+0.40}_{-0.58}$
Isolation cut	615	$93.04^{+0.95}_{-1.10}$
Min E cut	654	$98.94^{+0.40}_{-0.58}$
All above cuts	577	$87.29^{+1.28}_{-1.45}$
All cuts excl. isol.	604	$91.38^{+1.10}_{-1.24}$
Sliding isol. cut	622	$94.10^{+0.97}_{-1.08}$
All cuts (sliding isol.)	584	$88.35^{+1.20}_{-1.34}$
χ^2 cut	661	$100.00^{+0.00}_{-0.28}$
All cuts (χ^2)	577	$87.29^{+1.28}_{-1.45}$

TABLE X: Dataset bhmummP28: Muon ID efficiencies for SCMIO

Category	Fiducial	w/ Stub	Efficiency (%)
CMUP	3676	3169	$86.21^{+0.56}_{-0.59}$
CMX	2246	2136	$95.10^{+0.48}_{-0.50}$
CMX Arches	1742	1691	$97.07^{+0.41}_{-0.47}$
CMX Miniskirt	421	369	$87.65^{+1.71}_{-1.81}$
CMX Keystone	83	76	$91.57^{+3.16}_{-4.26}$
CMU-only	886	769	$86.79^{+1.19}_{-1.20}$
CMP-only	1000	877	$87.70^{+1.02}_{-1.13}$
CMX MiniKey	504	445	$88.29^{+1.45}_{-1.67}$

TABLE XI: Dataset bhmummP28: Muon reconstruction efficiencies

1st leg	2nd leg	1st passes	both pass	Efficiency (%)
CMUP	CMUP	1096	940	-
CMX	CMUP	1259	1173	$92.66^{+0.52}_{-0.48}$
CMUP	CMX	1381	1173	-
CMX	CMX	518	397	$85.65^{+0.78}_{-0.76}$
CMUP	ARCH	1077	980	-
CMUP	MK	304	193	-
ARCH	ARCH	359	314	-
ARCH	MK	131	71	-
MK	ARCH	78	71	$91.89^{+0.71}_{-0.64}$
MK	MK	21	12	$74.40^{+2.26}_{-2.13}$

TABLE XII: Dataset bhmummP28: Muon L1 trigger efficiencies

Category	Events Passing	Efficiency (%)
Pass L1	1173	-
CMUP	1054	$98.07^{+0.44}_{-0.53}$
CMX	984	$91.56^{+0.88}_{-0.98}$
CMUP-CMX	965	-
CMUPA	885	-
CMUPMK	169	-
CMUPARCH	812	$91.75^{+0.97}_{-1.08}$
CMUP-MK	153	$90.53^{+2.24}_{-2.84}$

TABLE XIII: Dataset bhmummP28: Muon L2 trigger efficiencies

Category	Events Passing	Efficiency (%)
Pass L1	1173	-
CMUP-CMUP$_S$	987	-
CMX-CMX$_S$	921	-
CMUP-CMX-CMUP$_S$	901	$91.57^{+0.87}_{-0.99}$
CMUP-CMX-CMX$_S$	903	$85.67^{+1.09}_{-1.15}$
CMUP-CMX-CMX$_S$-A	761	$85.99^{+1.22}_{-1.32}$
CMUP-CMX-CMX$_S$-MK	142	$84.02^{+2.89}_{-3.36}$

TABLE XIV: Dataset bhmummP28: Muon L2 SLAM trigger efficiencies

Category	Efficiency (%)
CMUP	$90.68^{+0.66}_{-0.73}$
CMX	$78.17^{+1.04}_{-1.11}$
ARCH	$84.10^{+1.11}_{-1.18}$
MK	$66.92^{+2.64}_{-3.00}$
CMUP$_S$	$84.67^{+0.94}_{-1.04}$
CMX$_S$	$73.15^{+1.15}_{-1.20}$
ARCH$_S$	$78.82^{+1.28}_{-1.35}$
MK$_S$	$62.11^{+2.87}_{-3.19}$

TABLE XVI: Dataset bhmummP28: Muon combined trigger efficiencies

Category	Events Passing	Efficiency (%)
Pass L2	965	-
CMUP	963	$99.79^{+0.12}_{-0.27}$
CMX	962	$99.69^{+0.18}_{-0.31}$
CMUP-CMX	960	-
CMUPA	810	-
CMUPMK	153	-
CMUPARCH	808	$99.75^{+0.16}_{-0.33}$
CMUP-MK	152	$99.35^{+0.51}_{-1.45}$

TABLE XV: Dataset bhmummP28: Muon L3 trigger efficiencies