

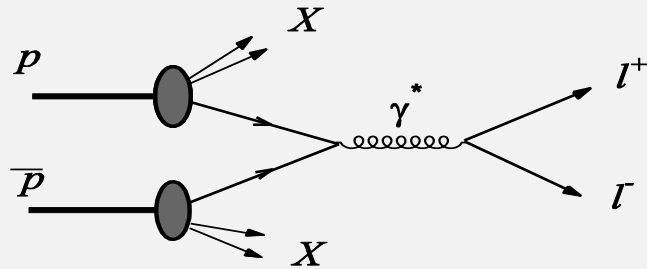
Drell-Yan at Phase1: cross-sections and muon distributions



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PANDA Collaboration Meeting

**4-8 September 2017,
BINP, Novosibirsk**



Drell-Yan process was simulated with use of PYTHIA 6.4 with beam momentum set 3.5 – 15.5 GeV at the statistics of 100000 events.

Number of events/year is calculated in assumption of 150 days/year data taking (~ 5 months) . Pictures are made for the case of HESRr accelerator mode with $R=10^7/s$ production rate.

Luminosities numbers were taken from the paper of Klaus Götzen "Average Luminosities and Event Rates at PANDA" Oct. 2015 (IN-IDE-2015-002.pdf)



Drell-Yan cross-sections

p [GeV/c]	Ecm [GeV]	Cross-section [nb]	Luminosity [HESRr]	Nevents / year
3.5	2.93	5.93×10^{-4}	997	88
4.0	3.08	1.99×10^{-2}	1070	3150
4.5	3.22	7.11×10^{-2}	1095	11685
5.0	3.36	1.61×10^{-1}	1116	26976
5.5	3.50	2.89×10^{-1}	1133	49114
6.0	3.63	4.52×10^{-1}	1148	77847
6.5	3.75	6.36×10^{-1}	1160	110753
7.0	3.87	8.50×10^{-1}	1170	149269
7.5	3.99	1.078	1179	190742
8.0	4.11	1.322	1186	235261
8.5	4.22	1.559	1192	278732
9.0	4.33	1.816	1197	326173
9.5	4.44	2.063	1202	371944

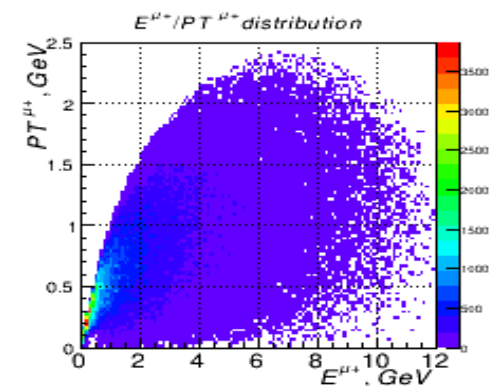
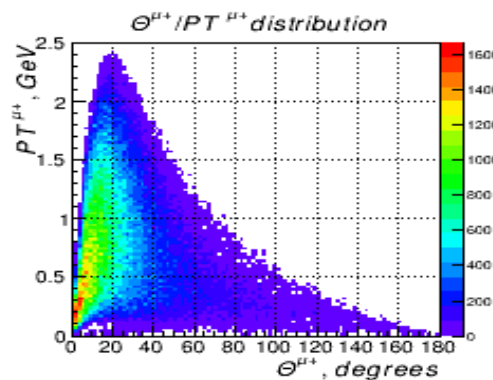
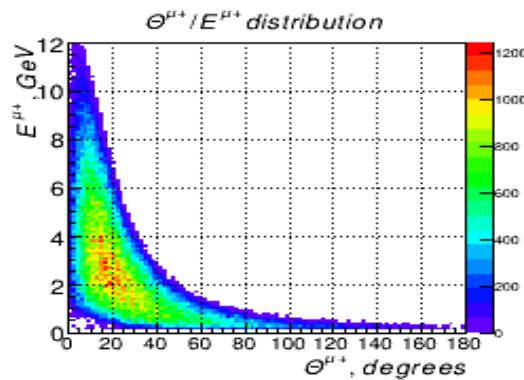
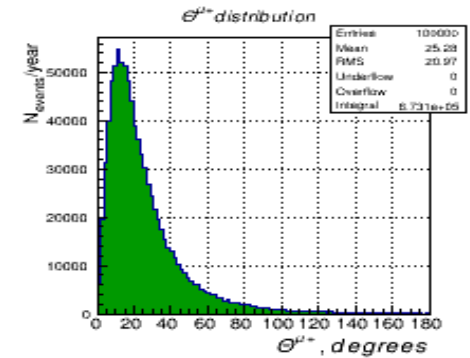
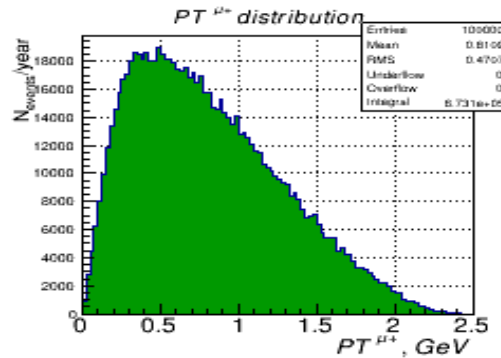
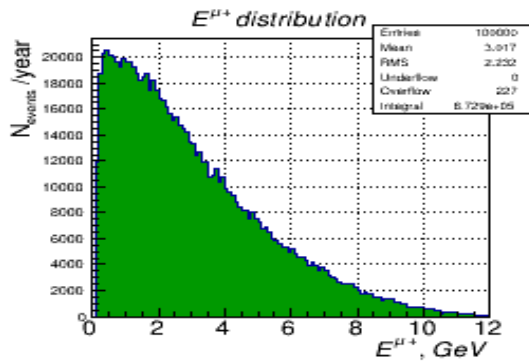


Drell-Yan cross-sections

p [GeV/c]	Ecm [GeV]	Cross-section [nb]	Luminosity [HESRr]	Nevents / year
10.0	4.54	2.309	1205	417421
10.5	4.64	2.568	1208	465267
11.0	4.74	2.813	1211	511064
11.5	4.84	3.068	1213	558288
12.0	4.93	3.309	1215	603097
12.5	5.03	3.538	1216	645317
13.0	5.12	3.761	1217	686653
13.5	5.21	3.988	1218	728726
14.0	5.30	4.200	1219	767948
14.5	5.39	4.398	1219	804216
15.0	5.47	4.609	1220	843403
15.5	5.56	4.771	1220	873104

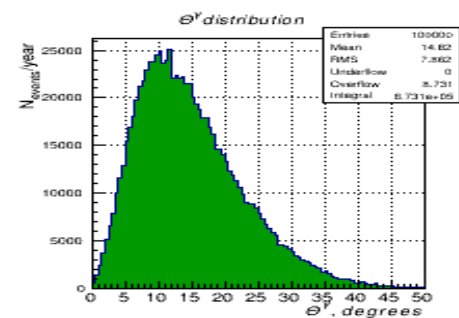
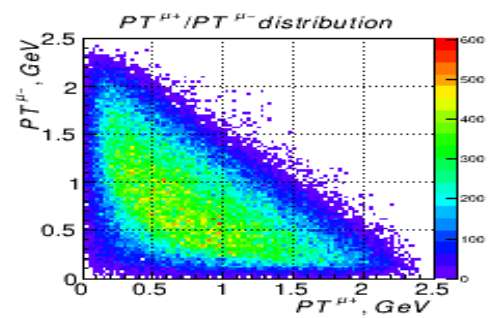
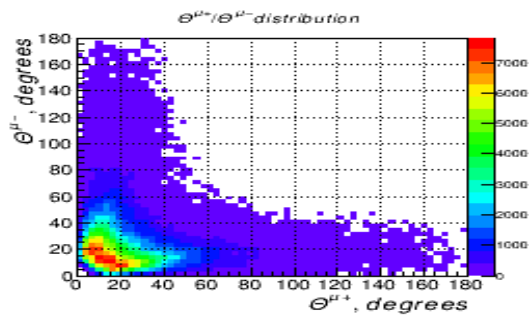
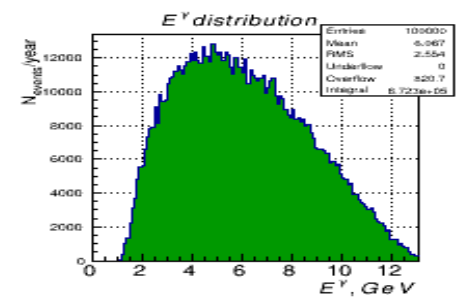
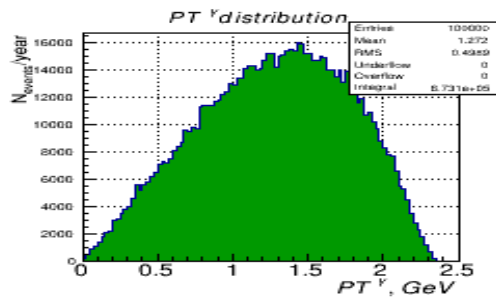
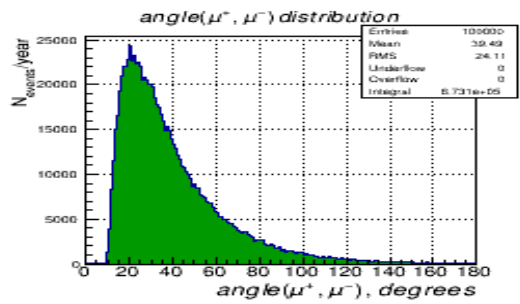


Muon distributions for $P_{\text{beam}} = 15.5 \text{ GeV}$ ($E_{\text{cms}} = 5.56 \text{ GeV}$, $\sigma = 4.771 \text{ nb}$)



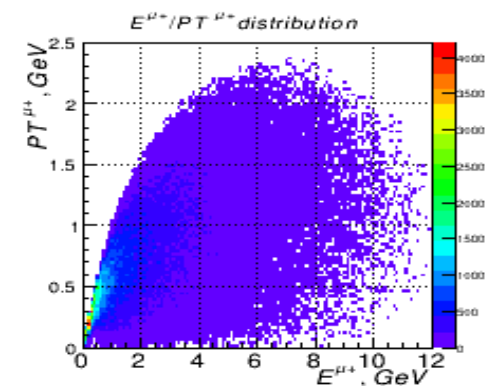
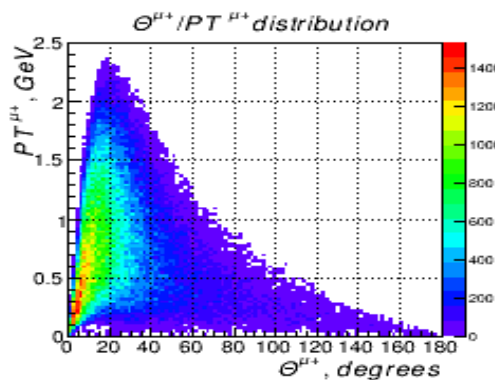
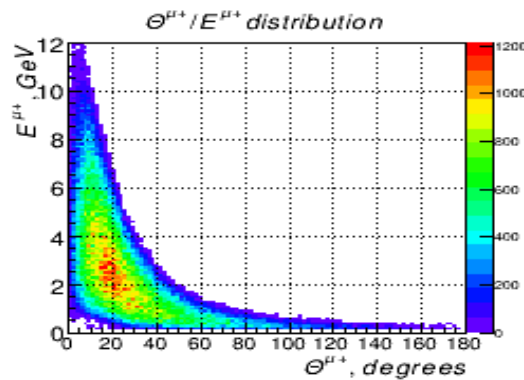
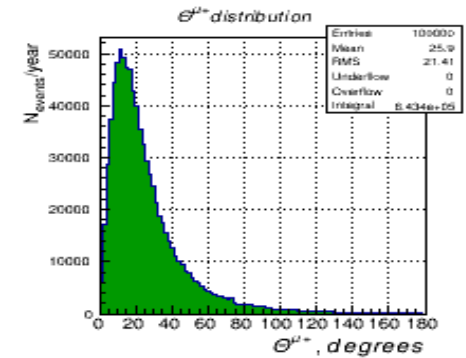
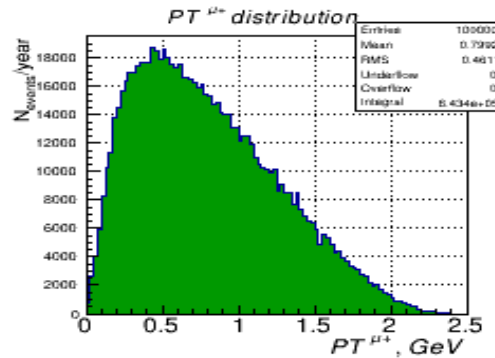
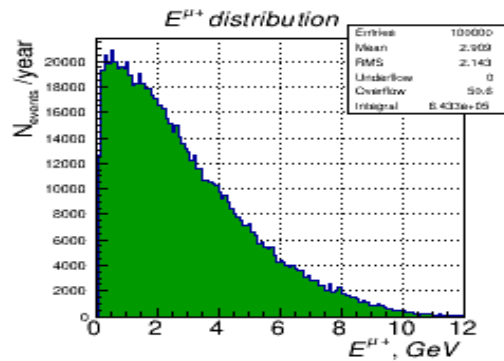


15.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	12565	1366	922	1126	13663	1366	1047	1220
Nev/day	59948	6517	4398	5372	65187	6517	4995	5820
Nev/year	8992259	977590	659837	805832	9778053	977590	749295	873104



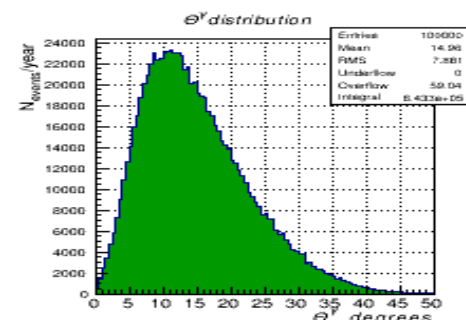
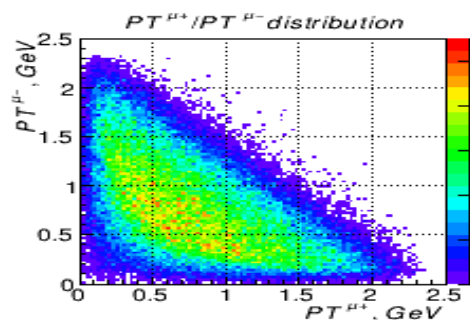
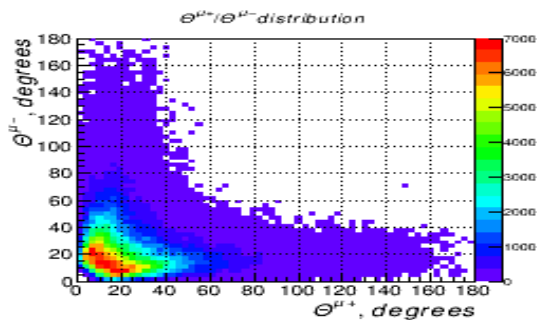
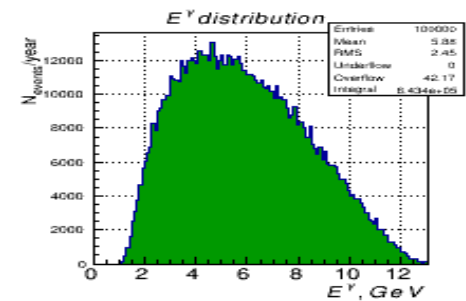
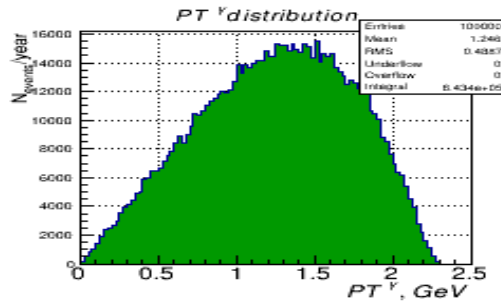
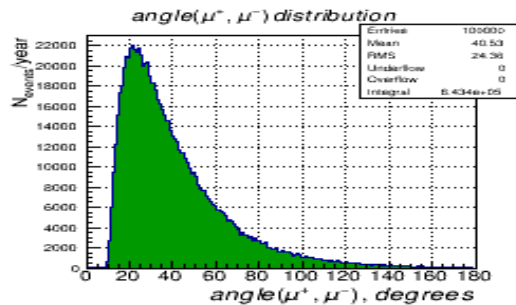


Muon distributions for $P_{\text{beam}} = 15.0 \text{ GeV}$ ($E_{\text{cms}} = 5.47 \text{ GeV}$, $\sigma = 4.609 \text{ nb}$)



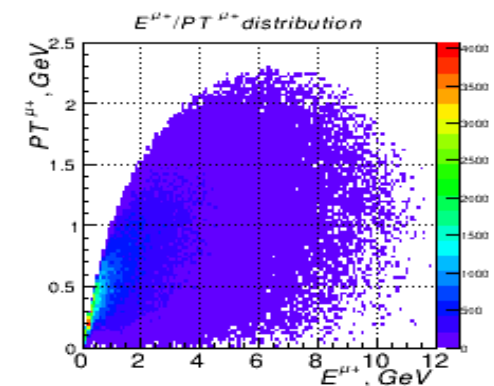
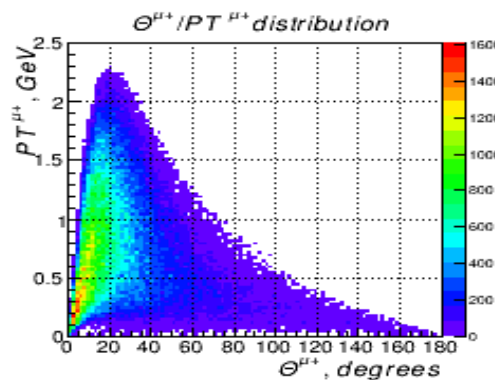
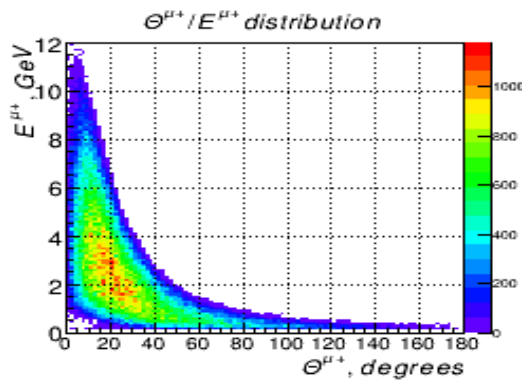
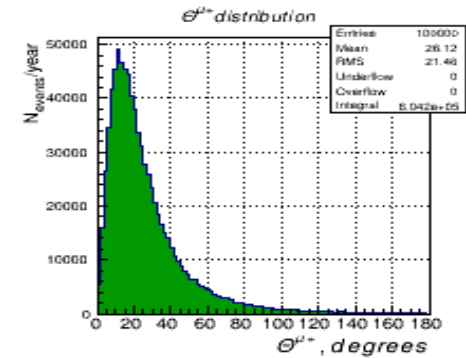
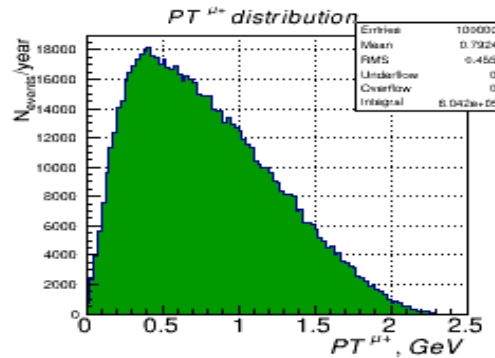
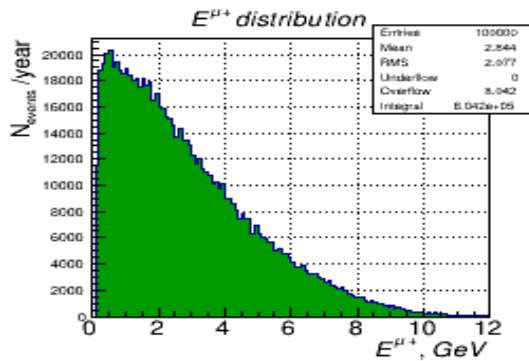


15.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	12471	1368	919	1125	13681	1368	1045	1220
Nev/day	57475	6304	4235	5184	63052	6304	4816	5622
Nev/year	8621385	945718	635318	777729	9457876	945718	722423	843403



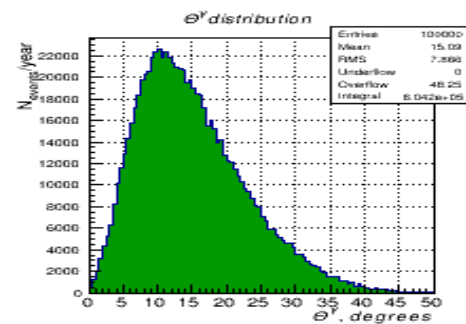
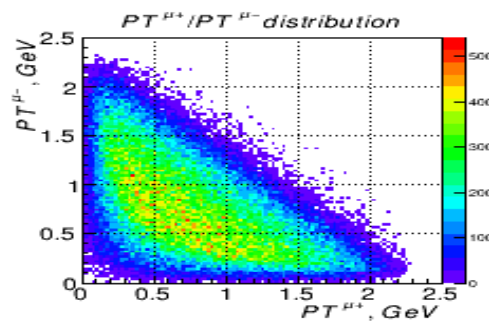
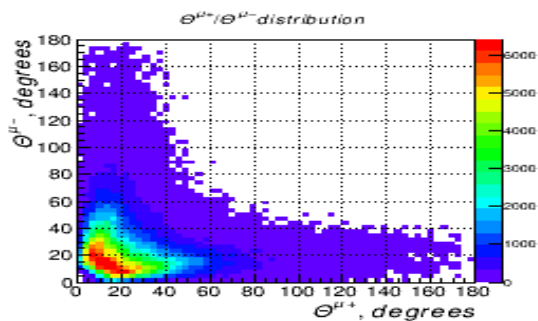
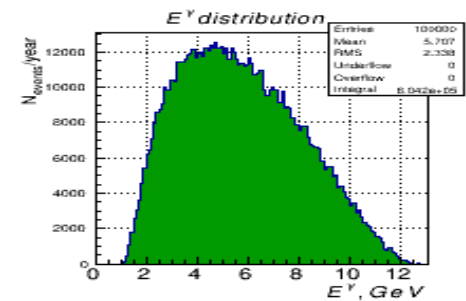
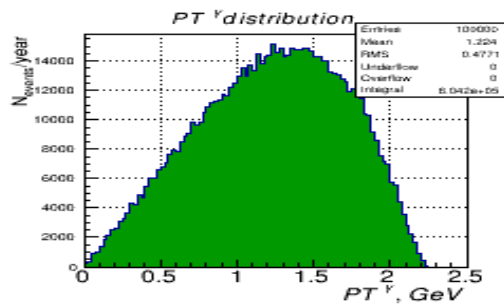
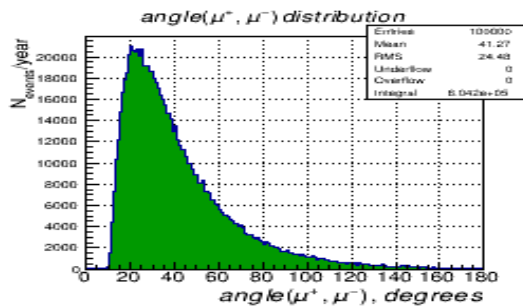


Muon distributions for $P_{\text{beam}} = 14.5 \text{ GeV}$ ($E_{\text{cms}} = 5.39 \text{ GeV}$, $\sigma = 4.398 \text{ nb}$)



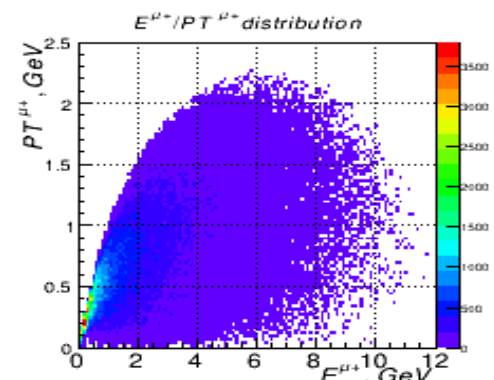
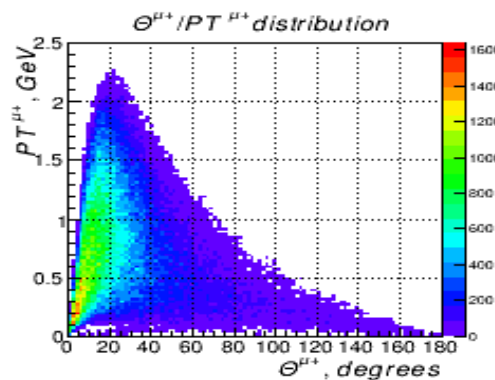
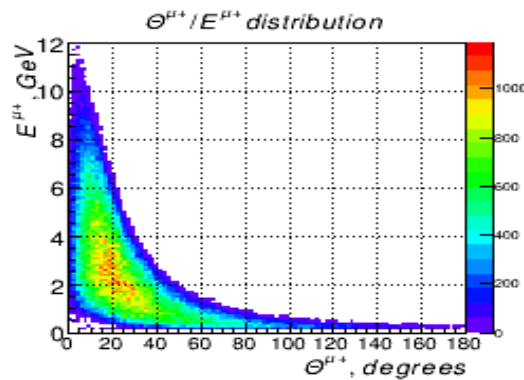
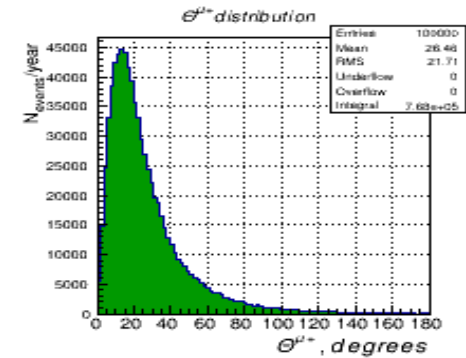
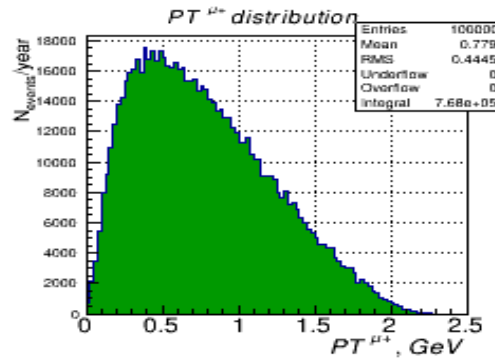
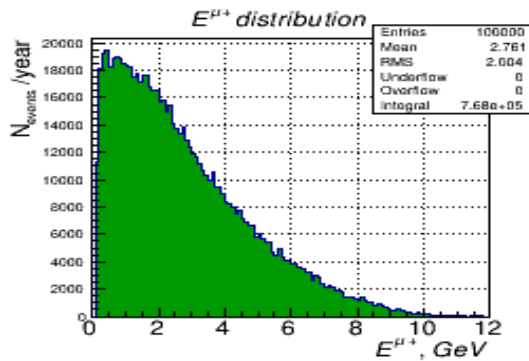


14.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	12369	1370	917	1124	13698	1370	1043	1219
Nev/day	54401	6025	4033	4943	60246	6025	4587	5361
Nev/year	8160259	903836	604976	741541	9037047	903836	688103	804216



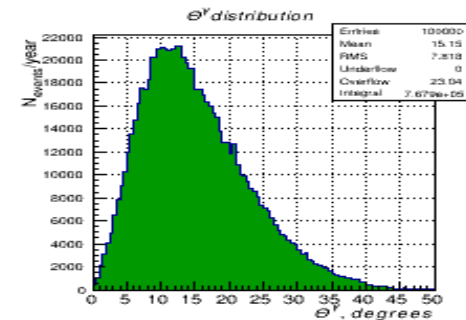
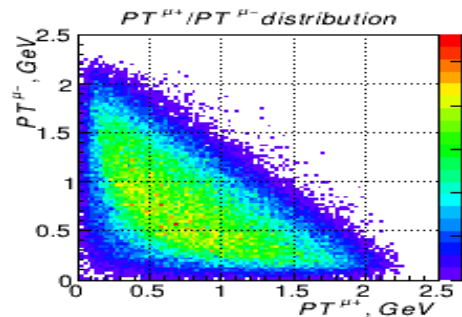
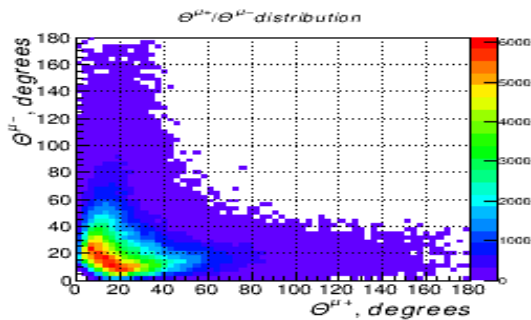
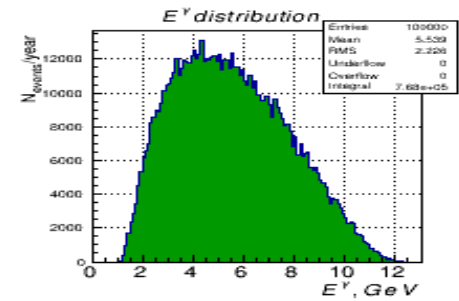
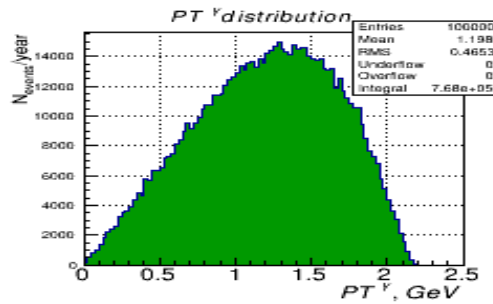
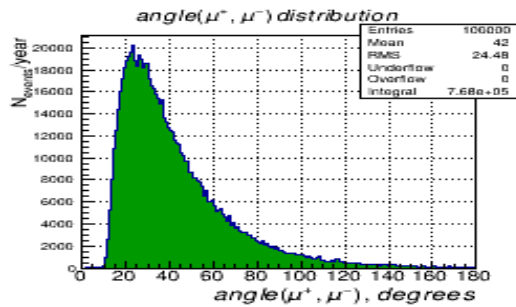


Muon distributions for $P_{\text{beam}} = 14.0 \text{ GeV}$ ($E_{\text{cms}} = 5.30 \text{ GeV}$, $\sigma = 4.200 \text{ nb}$)



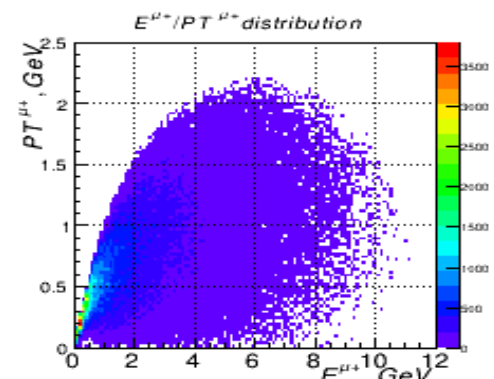
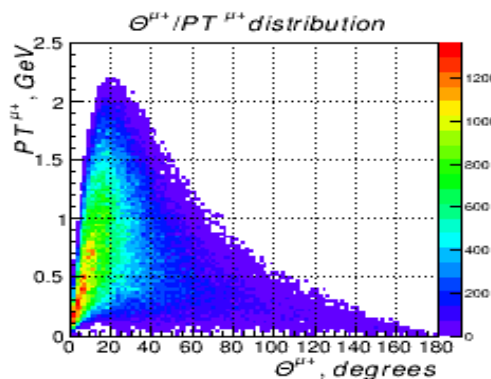
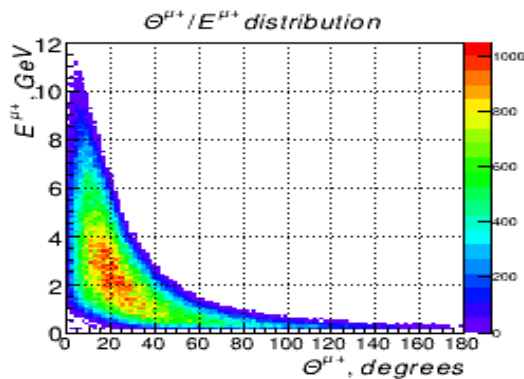
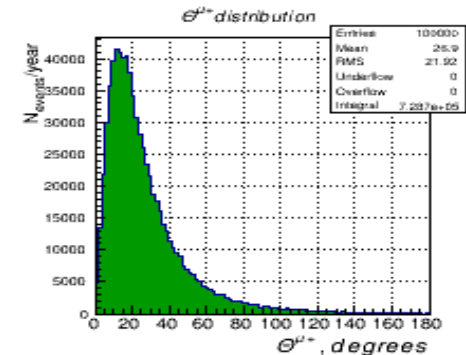
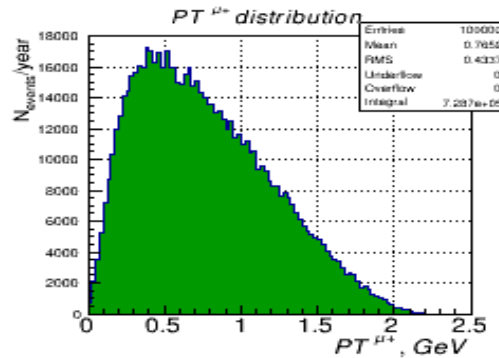
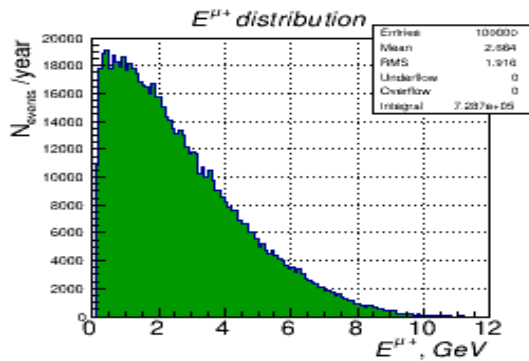


14.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	12259	1371	915	1122	13714	1371	1041	1219
Nev/day	51486	5758	3842	4712	57597	5758	4372	5119
Nev/year	7722957	863706	576434	706840	8639582	863706	655811	767948



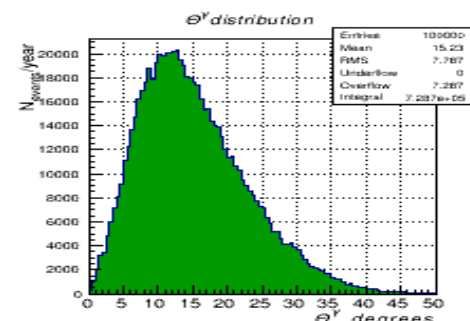
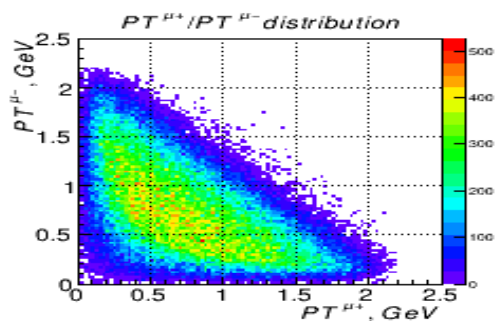
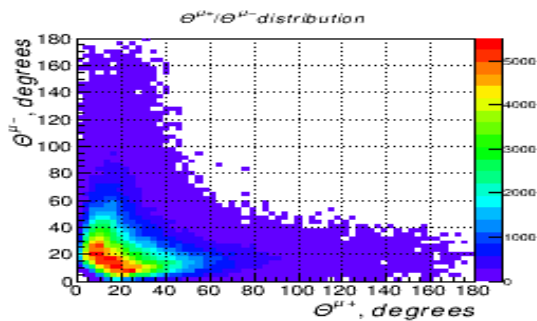
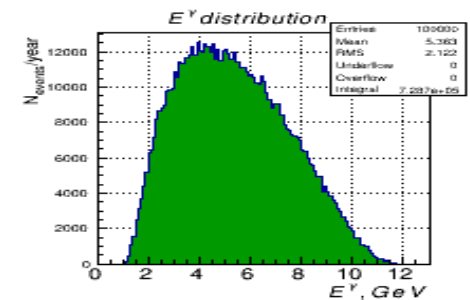
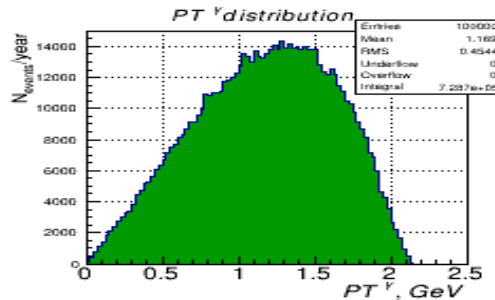
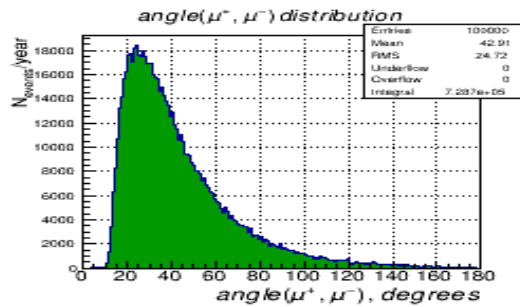


Muon distributions for $P_{\text{beam}} = 13.5 \text{ GeV}$ ($E_{\text{cms}} = 5.21 \text{ GeV}$, $\sigma = 3.988 \text{ nb}$)



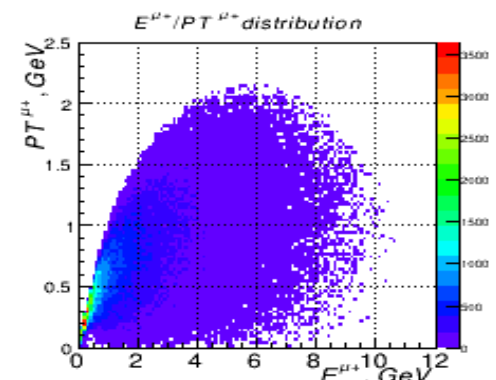
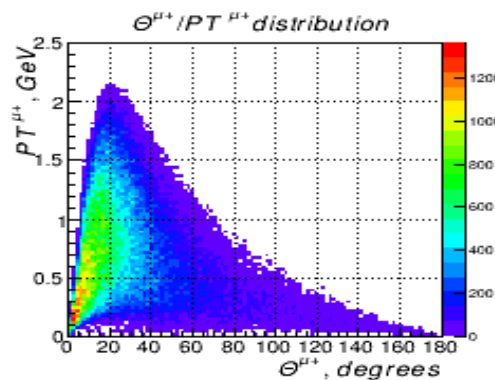
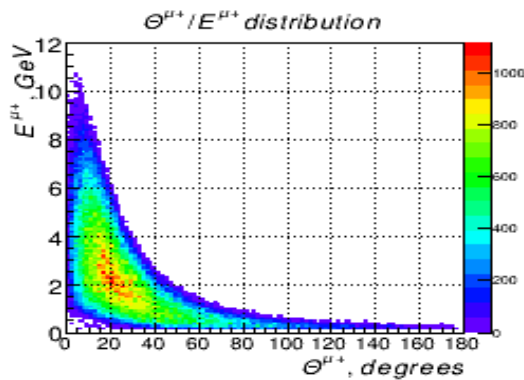
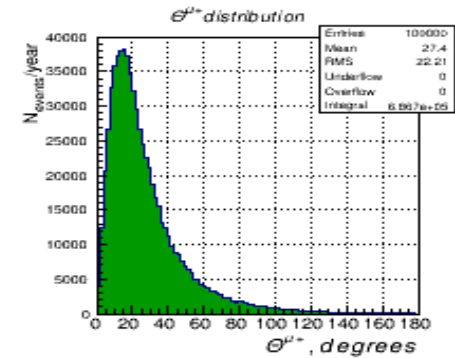
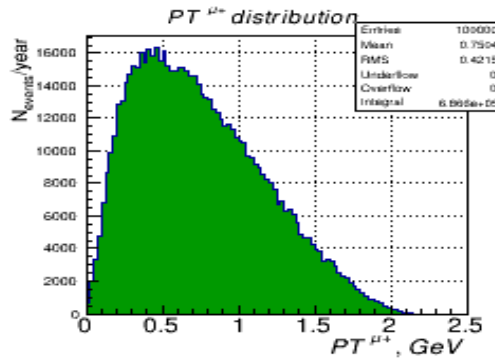
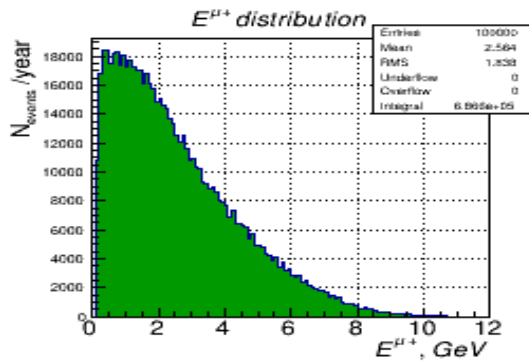


13.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	12139	1373	912	1120	13730	1373	1039	1218
Nev/day	48418	5476	3637	4467	54764	5476	4144	4858
Nev/year	7262734	821462	545647	670093	8214626	821462	621631	728726



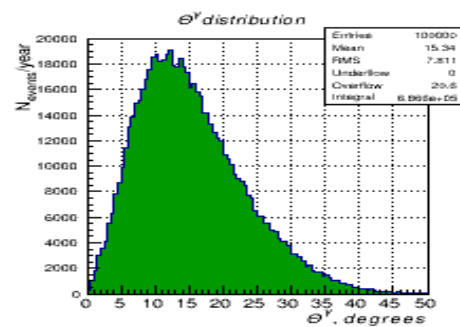
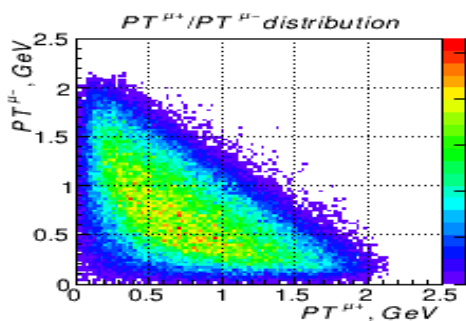
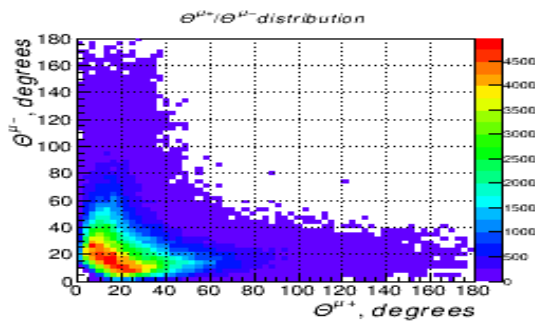
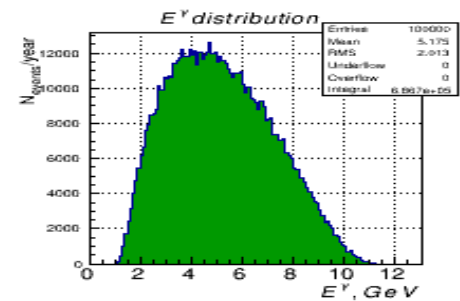
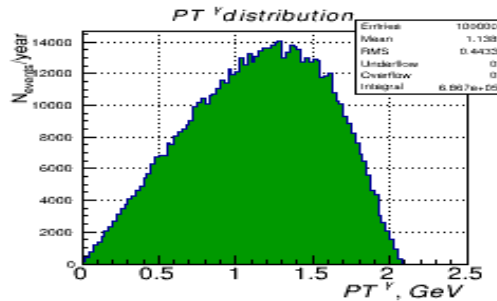
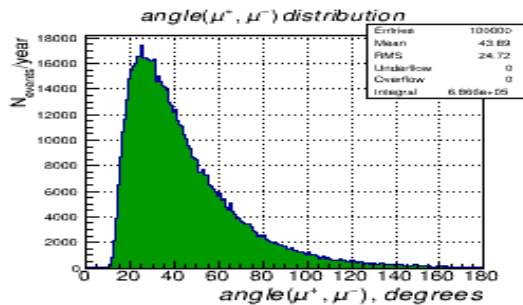


Muon distributions for $P_{\text{beam}} = 13.0 \text{ GeV}$ ($E_{\text{cms}} = 5.12 \text{ GeV}$, $\sigma = 3.761 \text{ nb}$)



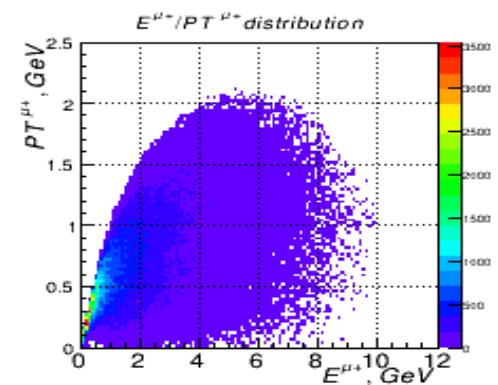
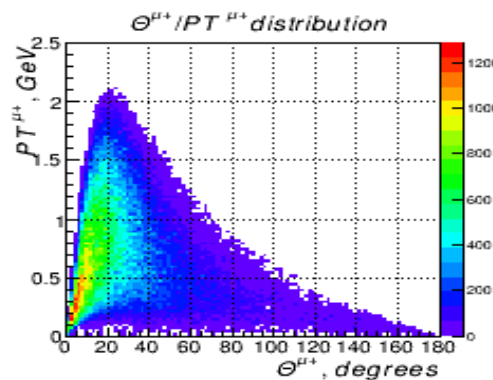
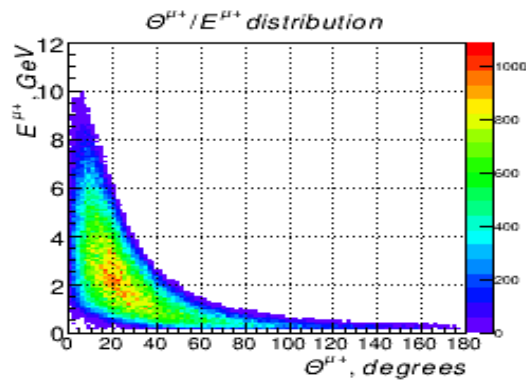
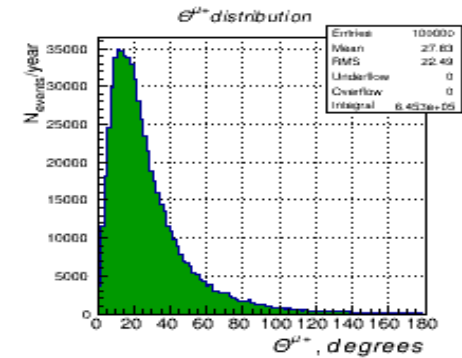
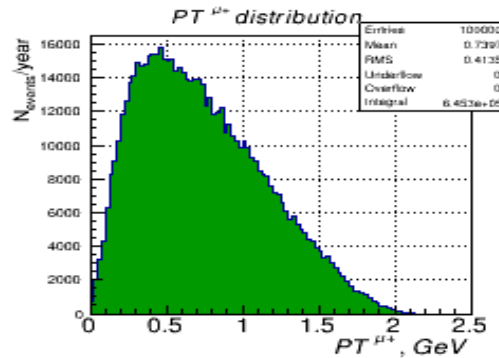
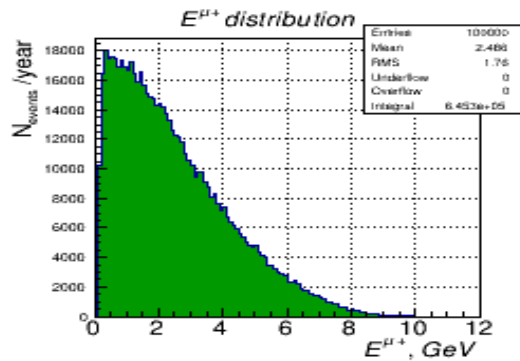


13.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	12010	1374	909	1118	13744	1374	1037	1217
Nev/day	45175	5168	3419	4205	51697	5168	3900	4577
Nev/year	6776258	775235	512874	630795	7754612	775235	585094	686653



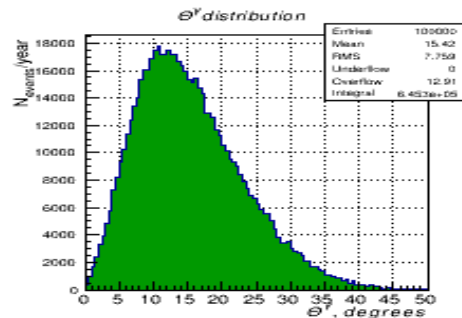
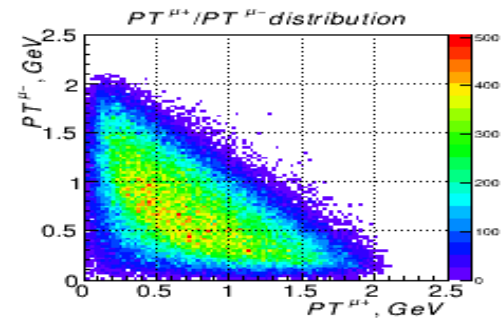
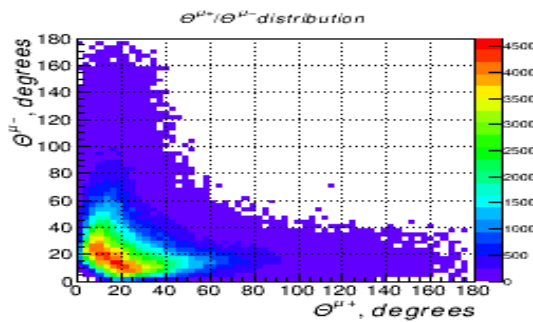
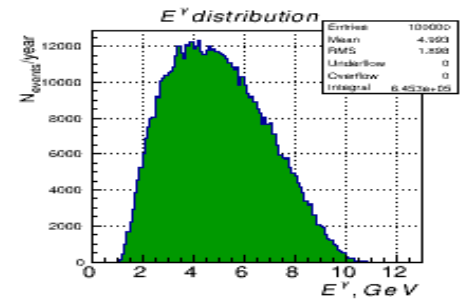
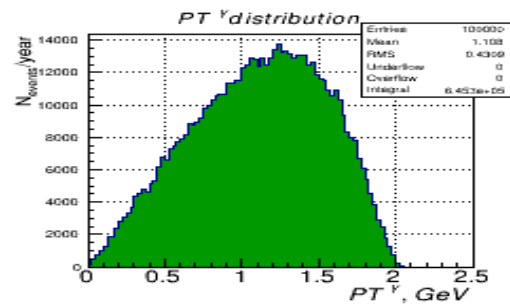
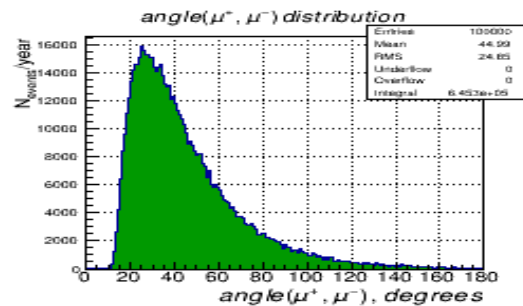


Muon distributions for $P_{\text{beam}} = 12.5 \text{ GeV}$ ($E_{\text{cms}} = 5.03 \text{ GeV}$, $\sigma = 3.538 \text{ nb}$)



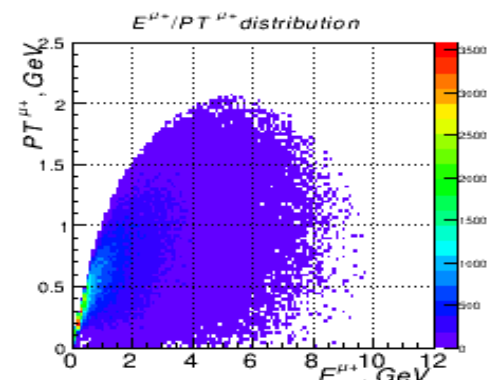
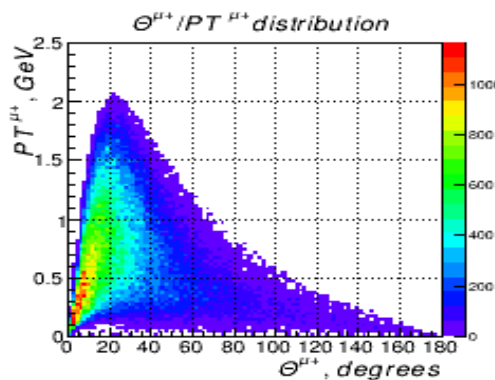
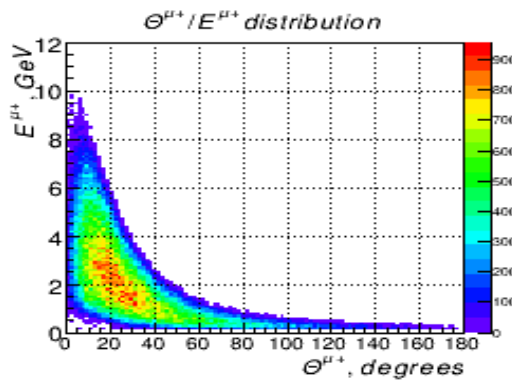
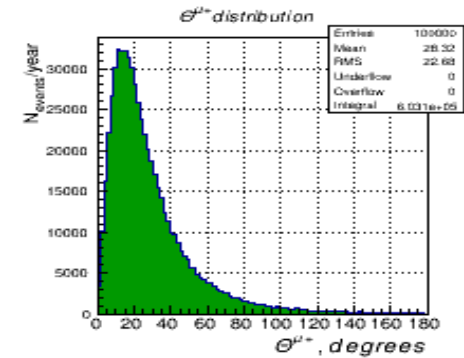
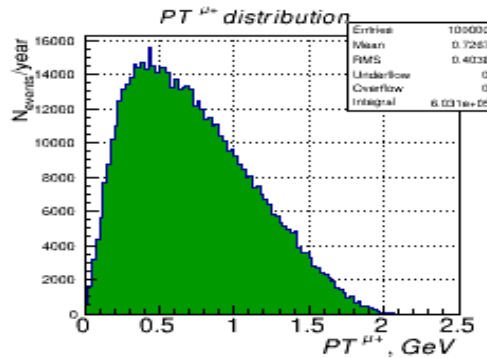
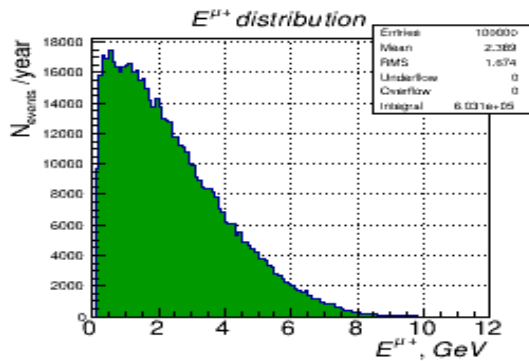


12.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	11871	1376	905	1116	13757	1376	1034	1216
Nev/day	41998	4868	3201	3948	48671	4868	3658	4302
Nev/year	6299810	730228	480273	592249	7300690	730228	548732	646317



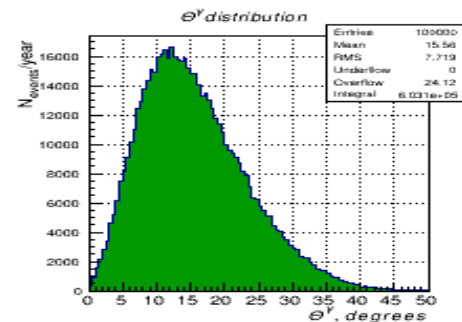
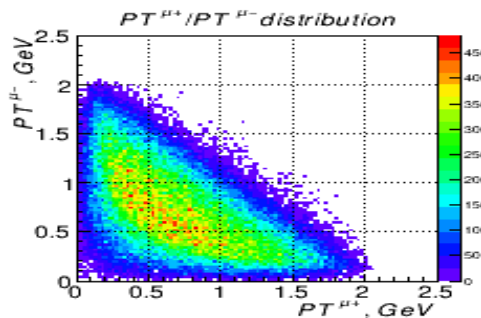
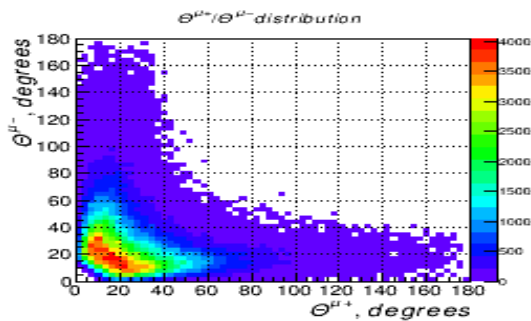
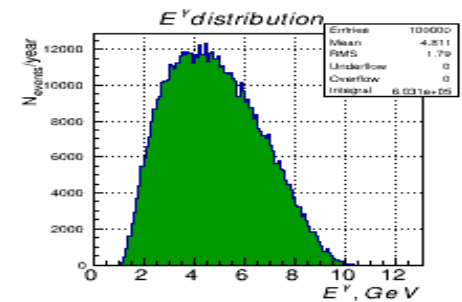
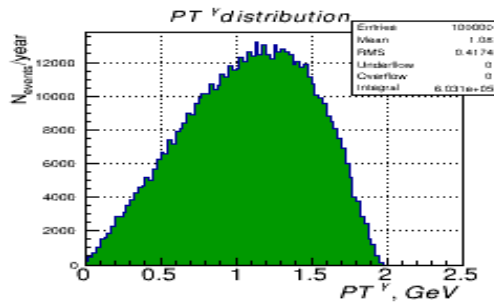
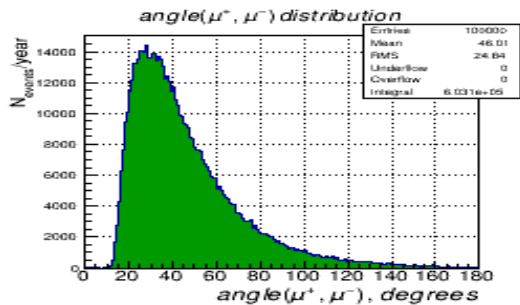


Muon distributions for $P_{\text{beam}} = 12.0 \text{ GeV}$ ($E_{\text{cms}} = 4.93 \text{ GeV}$, $\sigma = 3.309 \text{ nb}$)



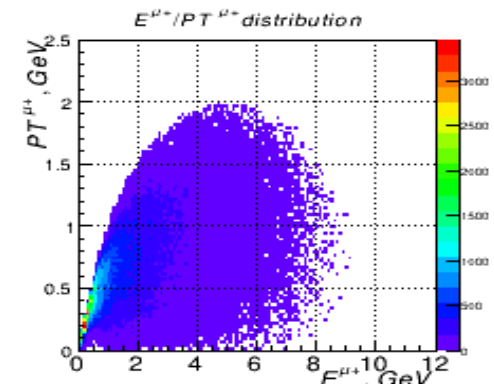
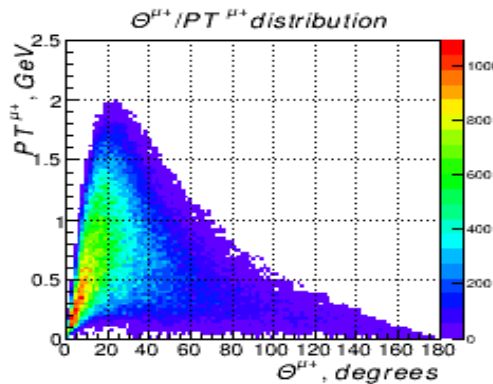
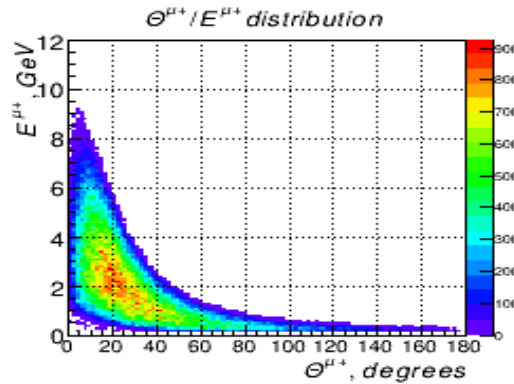
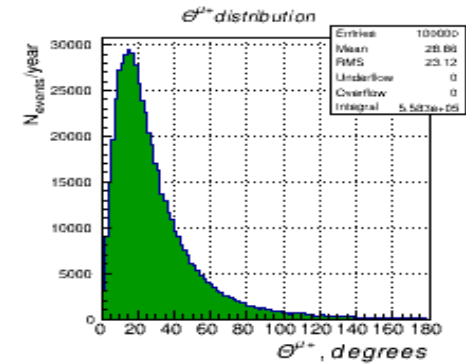
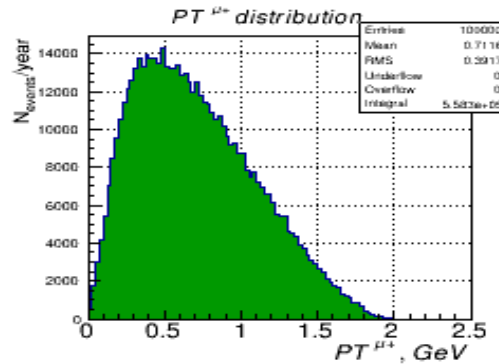
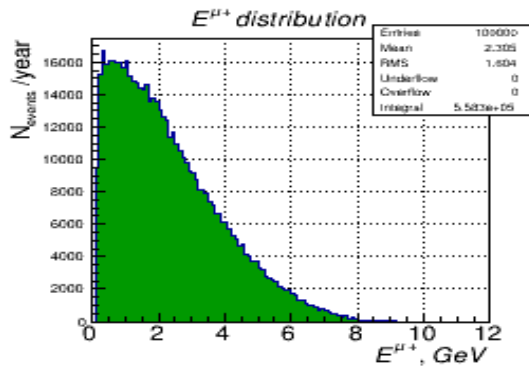


12.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	11721	1377	902	1113	13769	1377	1031	1215
Nev/day	38786	4556	2984	3683	45564	4556	3411	4020
Nev/year	5818031	683510	447731	552467	6834611	683510	511764	603097



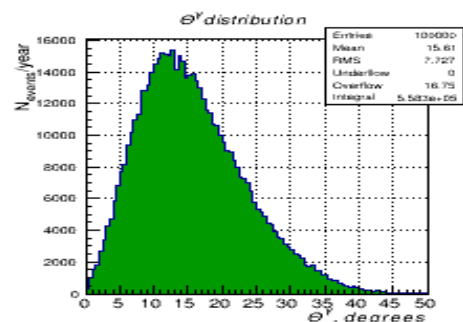
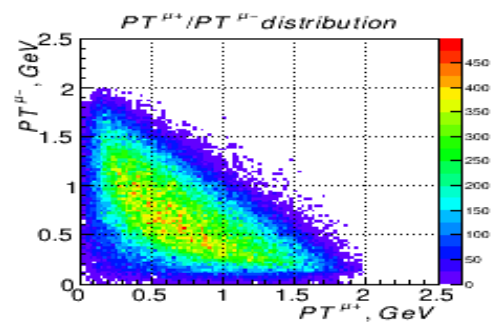
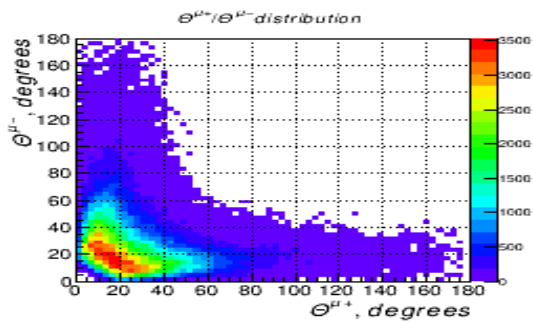
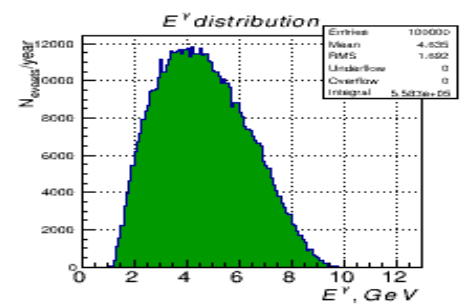
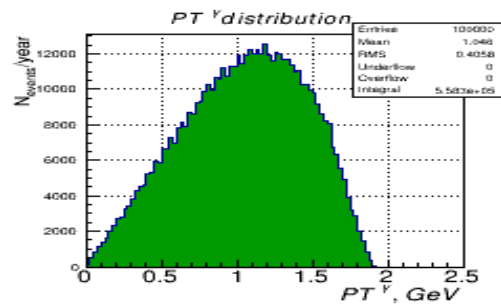
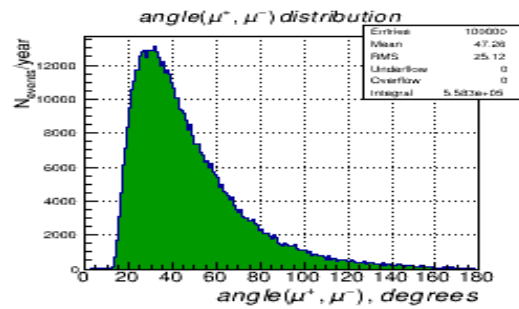


Muon distributions for $P_{\text{beam}} = 11.5 \text{ GeV}$ ($E_{\text{cms}} = 4.84 \text{ GeV}$, $\sigma = 3.068 \text{ nb}$)



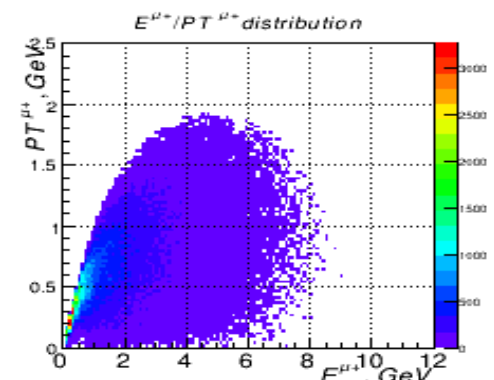
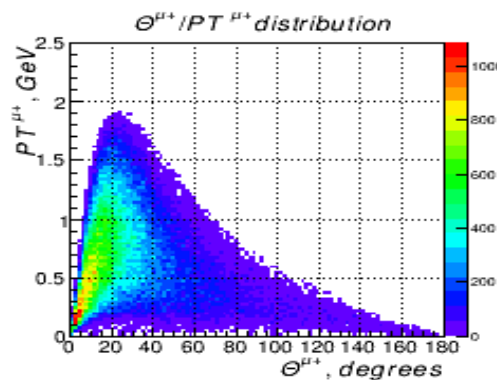
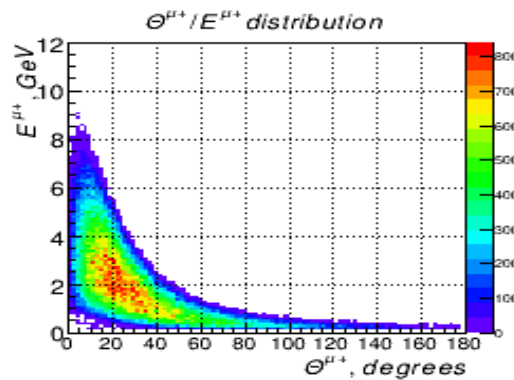
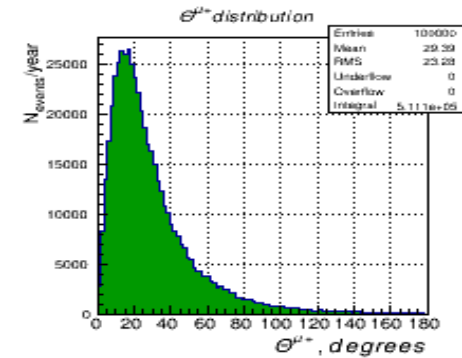
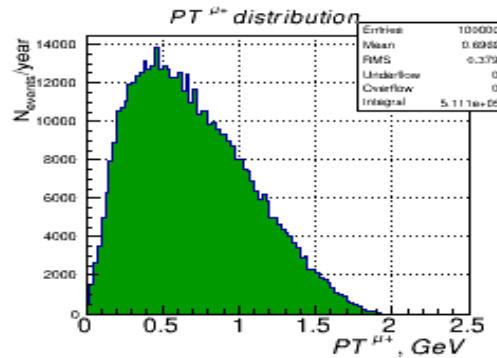
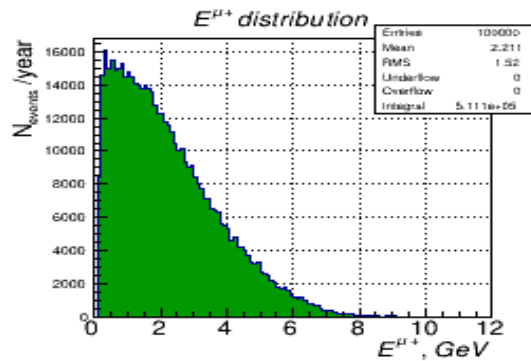


11.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	11560	1378	898	1110	13778	1378	1028	1213
Nev/day	35470	4228	2755	3405	42275	4228	3154	3721
Nev/year	5320535	634229	413308	510881	6341379	634229	473141	558288



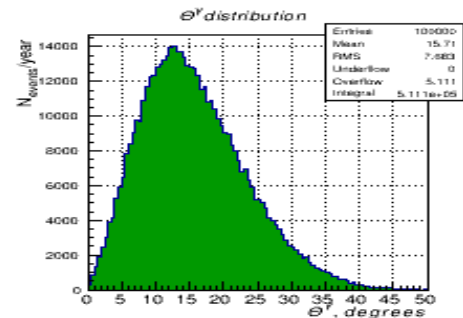
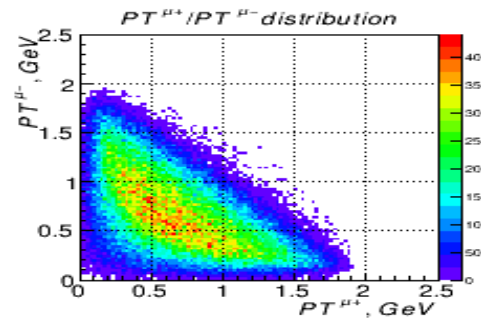
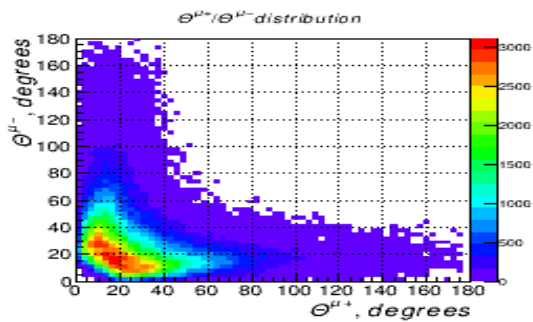
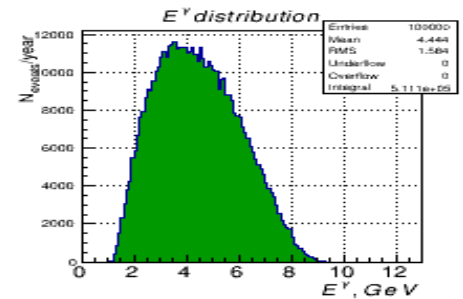
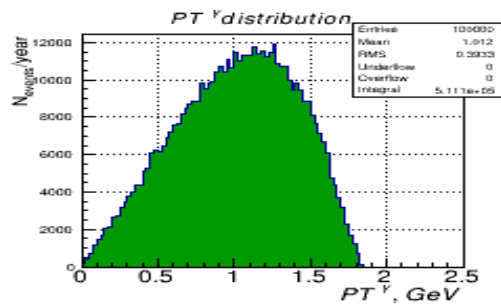
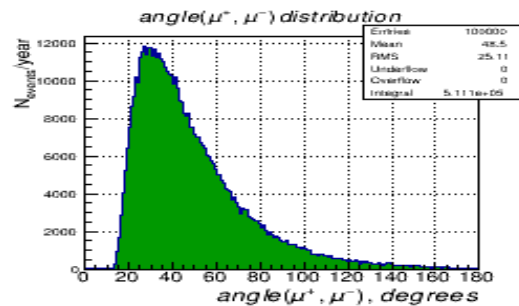


Muon distributions for $P_{\text{beam}} = 11.0 \text{ GeV}$ ($E_{\text{cms}} = 4.74 \text{ GeV}$, $\sigma = 2.813 \text{ nb}$)



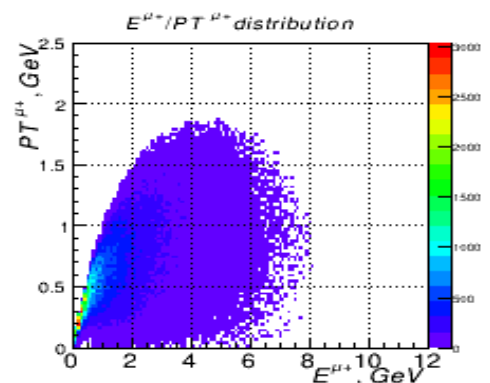
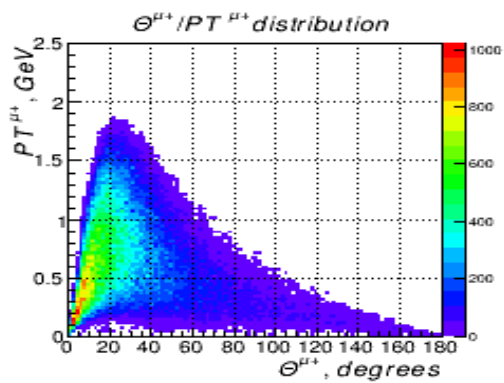
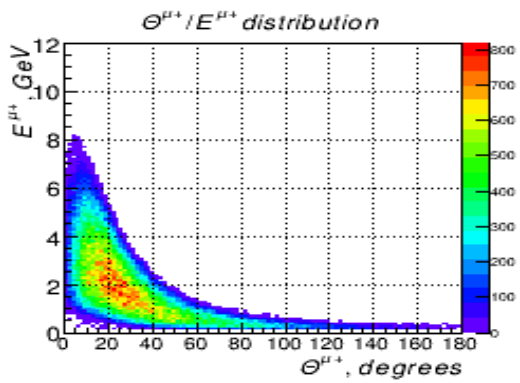
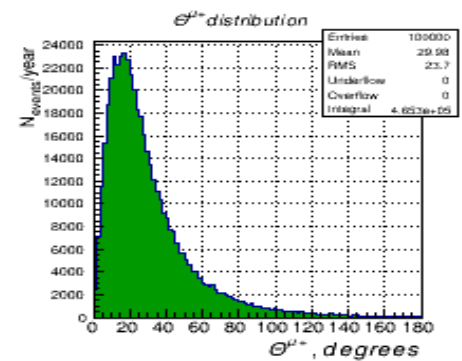
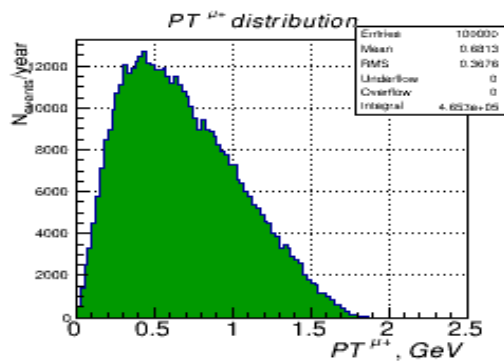
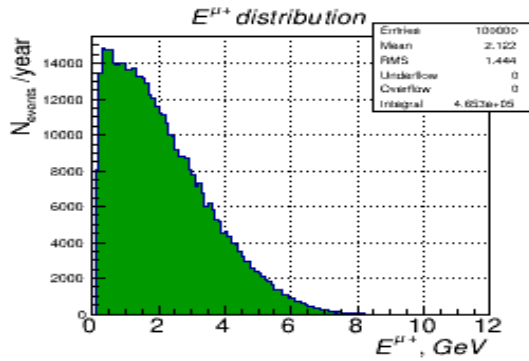


11.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	11387	1379	894	1107	13786	1379	1024	1211
Nev/day	32036	3879	2515	3114	38786	3879	2880	3407
Nev/year	4805524	581963	377284	467174	5817947	581963	432146	511064



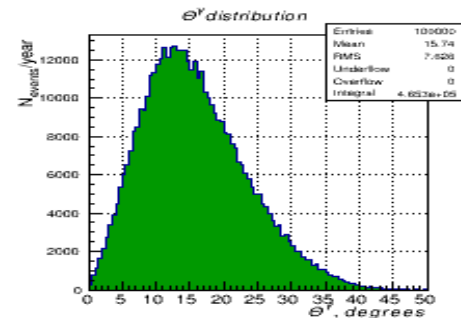
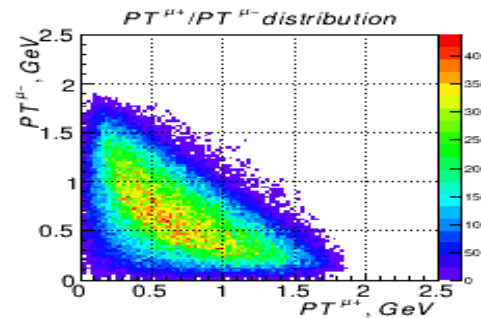
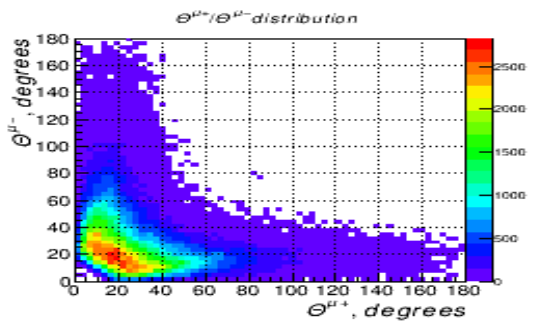
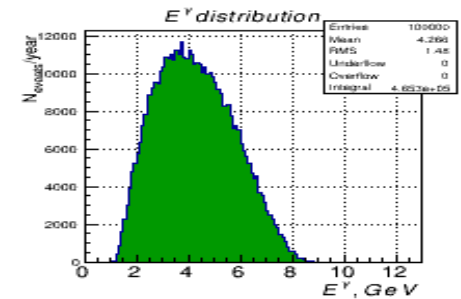
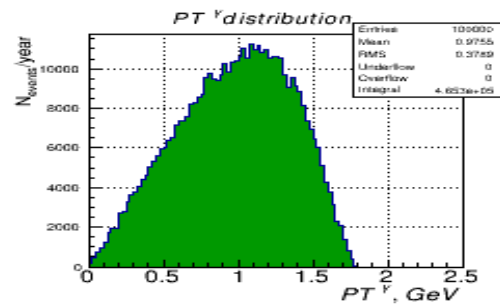
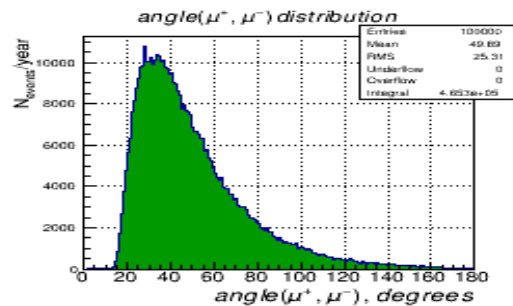


Muon distributions for $P_{\text{beam}} = 10.5 \text{ GeV}$ ($E_{\text{cms}} = 4.64 \text{ GeV}$, $\sigma = 2.568 \text{ nb}$)



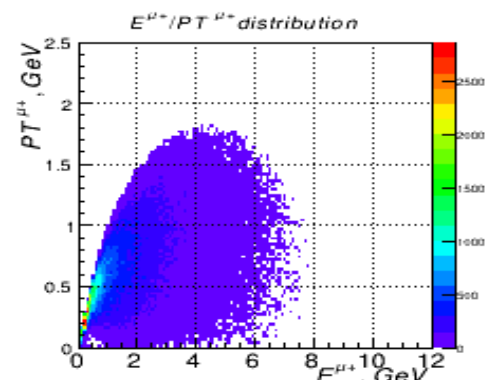
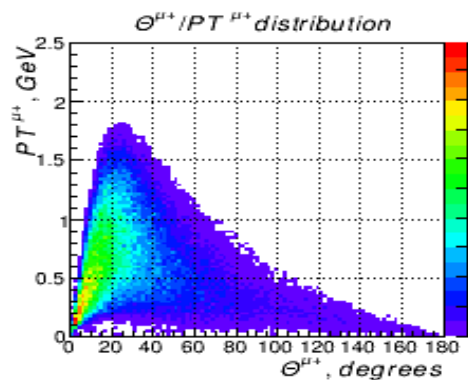
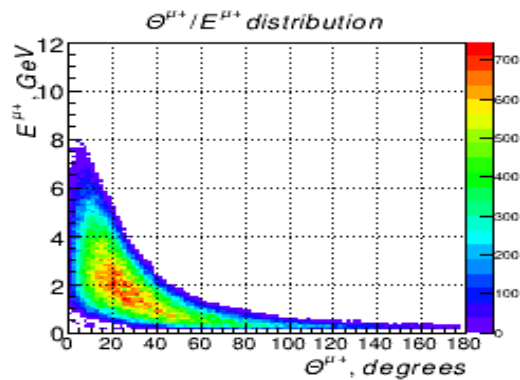
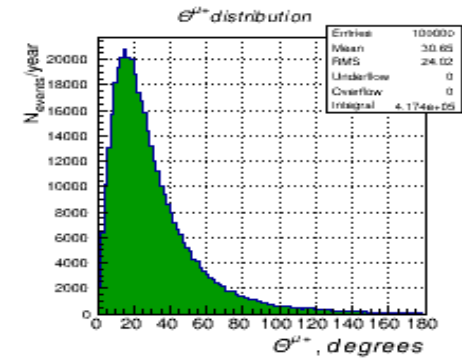
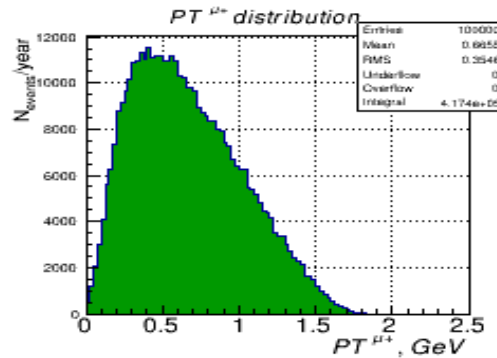
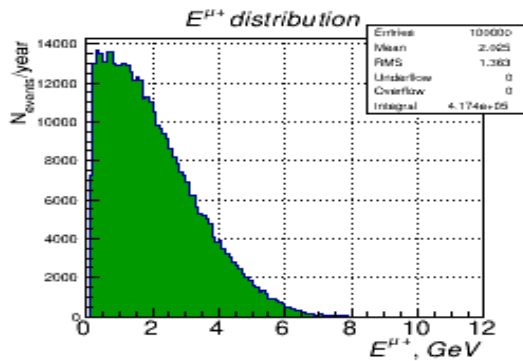


10.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	11201	1379	889	1103	13791	1379	1020	1208
Nev/day	28760	3540	2282	2832	35411	3540	2619	3101
Nev/year	4314125	531129	342403	424826	5311678	531129	392858	465267



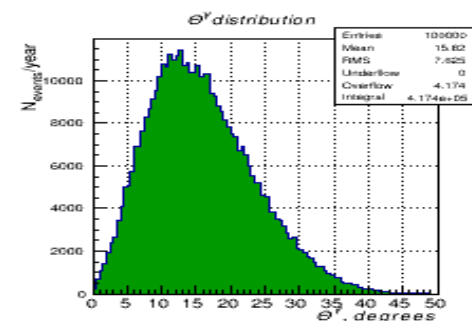
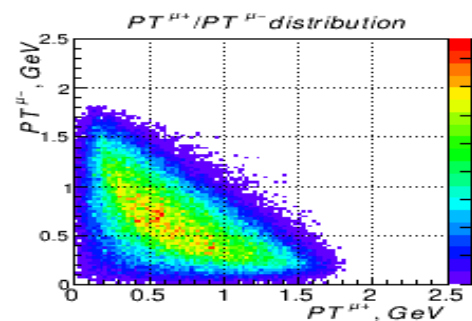
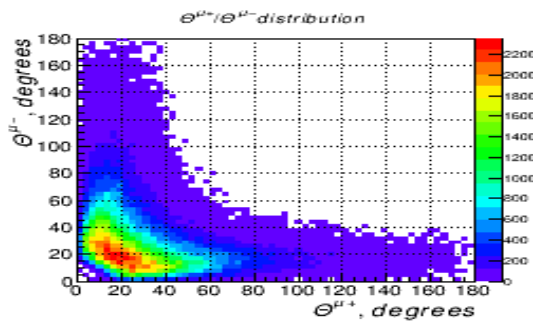
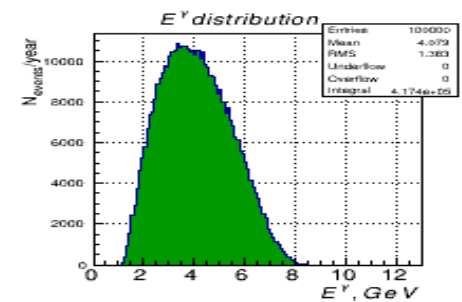
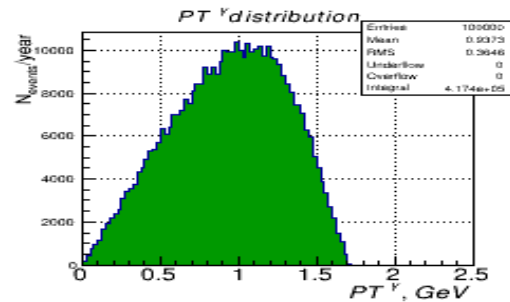
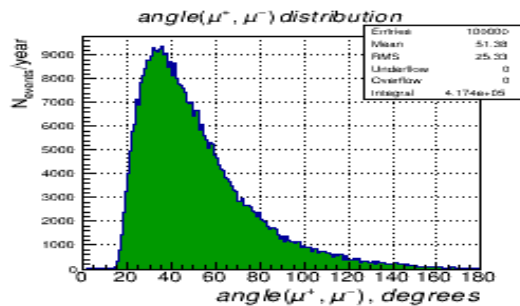


Muon distributions for $P_{\text{beam}} = 10.0 \text{ GeV}$ ($E_{\text{cms}} = 4.54 \text{ GeV}$, $\sigma = 2.309 \text{ nb}$)



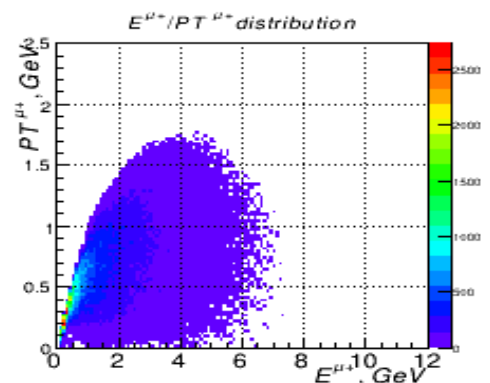
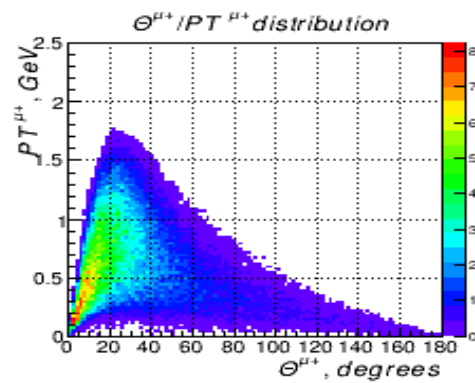
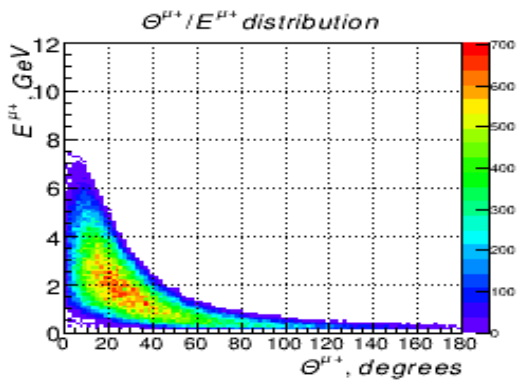
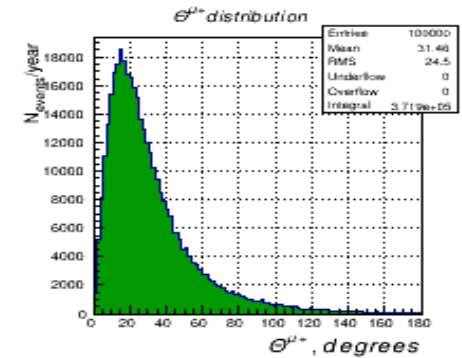
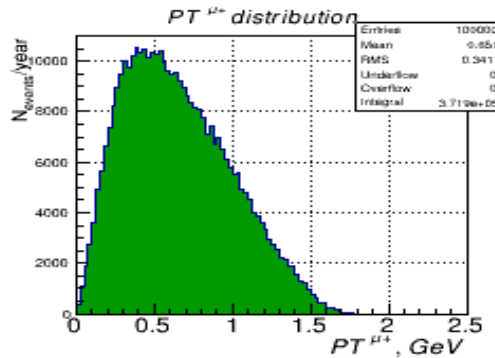
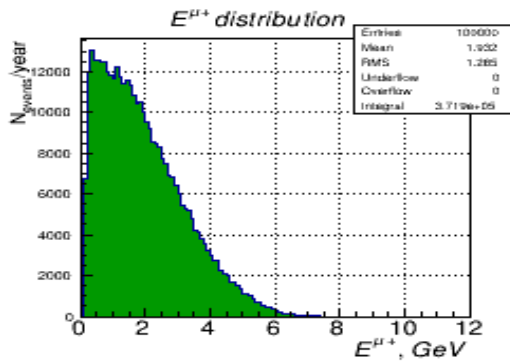


10.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	11002	1379	883	1098	13792	1379	1015	1205
Nev/day	25407	3184	2039	2535	31851	3184	2344	2782
Nev/year	3811175	477695	305877	380355	4777652	477695	351603	417421



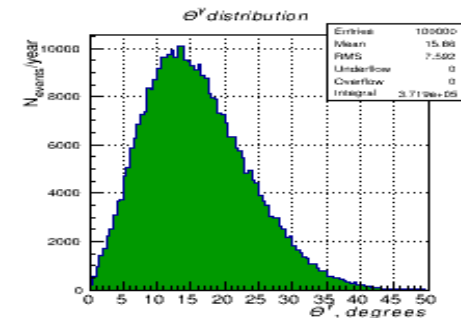
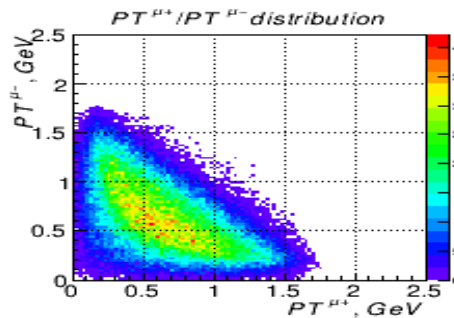
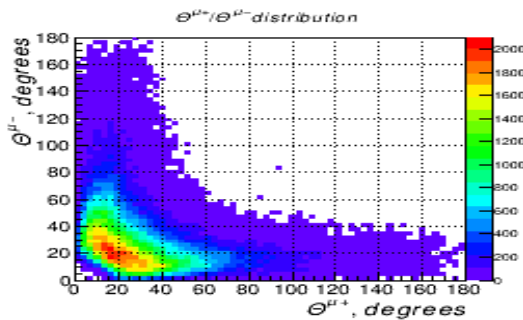
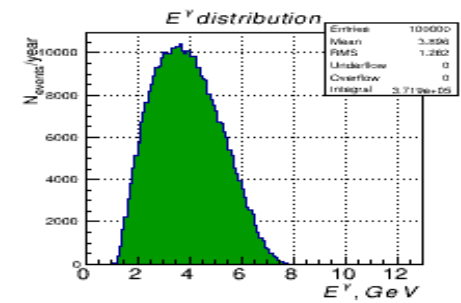
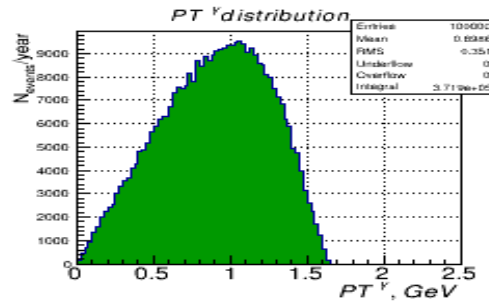
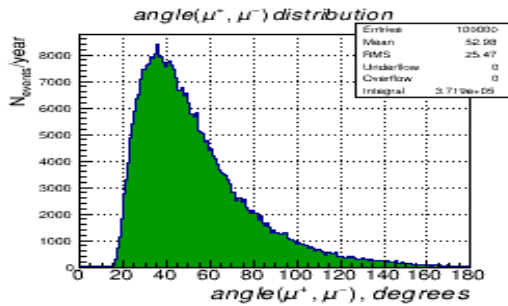


Muon distributions for $P_{\text{beam}} = 9.5 \text{ GeV}$ ($E_{\text{cms}} = 4.43 \text{ GeV}$, $\sigma = 2.063 \text{ nb}$)

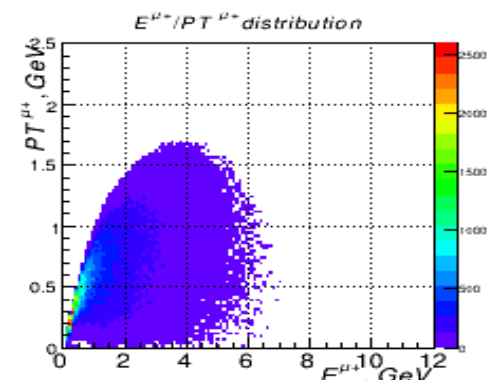
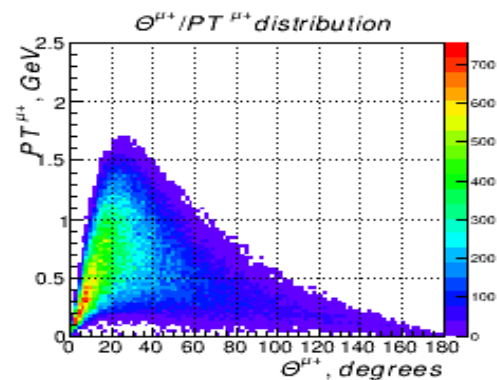
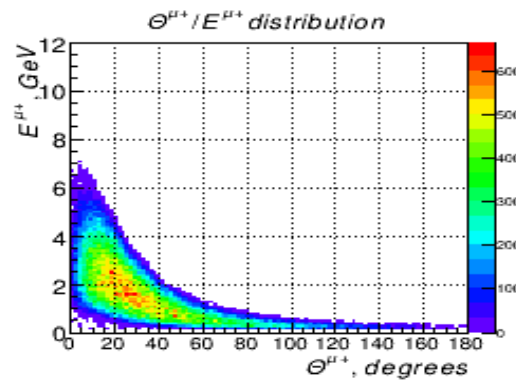
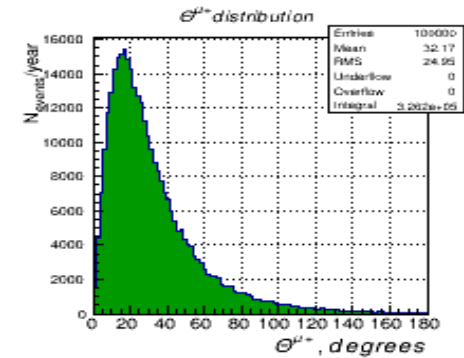
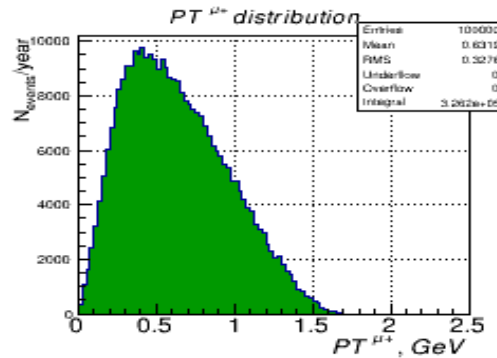
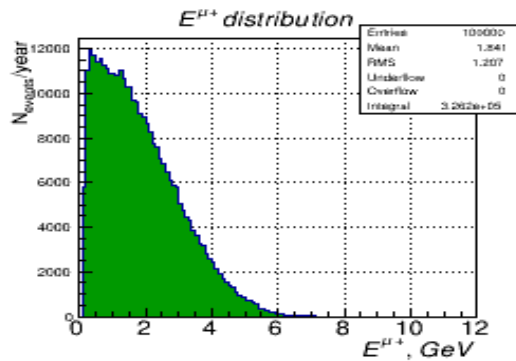




9.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	10788	1379	878	1093	13790	1379	1010	1202
Nev/day	22254	2844	1811	2254	28447	2844	2083	2479
Nev/year	3338214	426714	271686	338215	4267146	426714	312532	371944

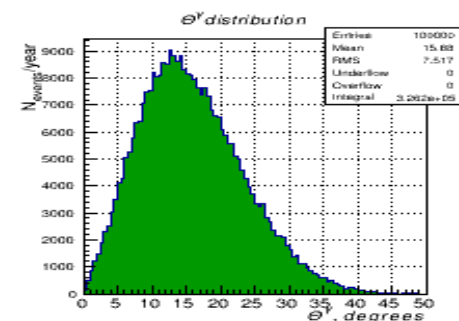
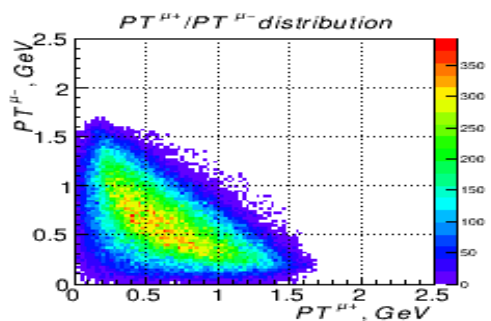
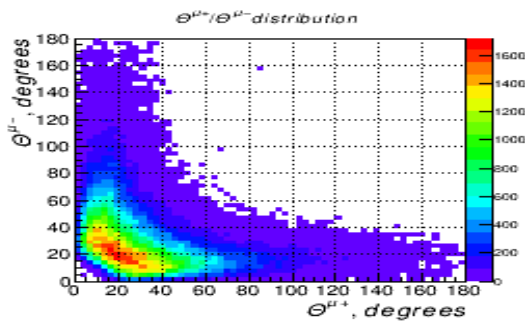
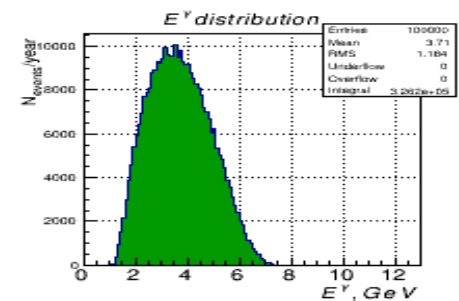
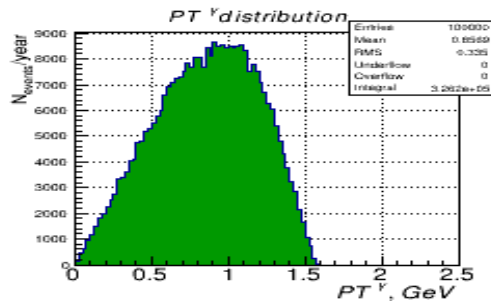
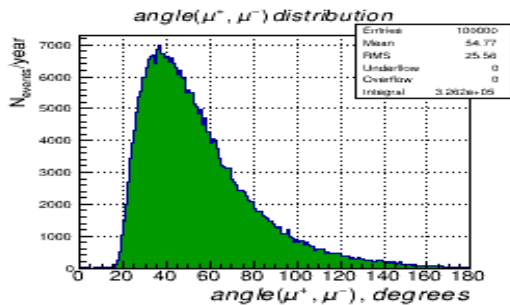


Muon distributions for $P_{\text{beam}} = 9.0 \text{ GeV}$ ($E_{\text{cms}} = 4.33 \text{ GeV}$, $\sigma = 1.816 \text{ nb}$)



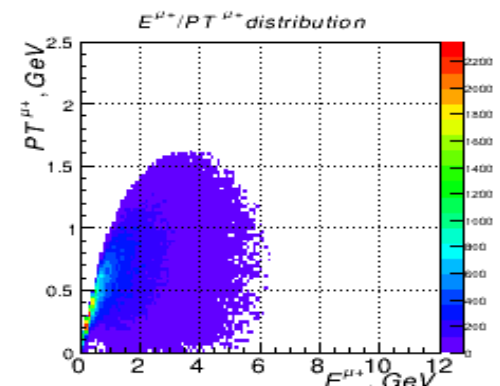
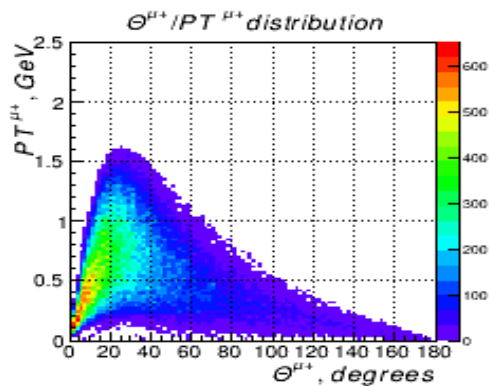
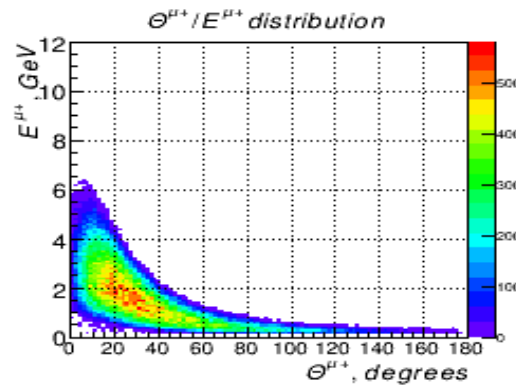
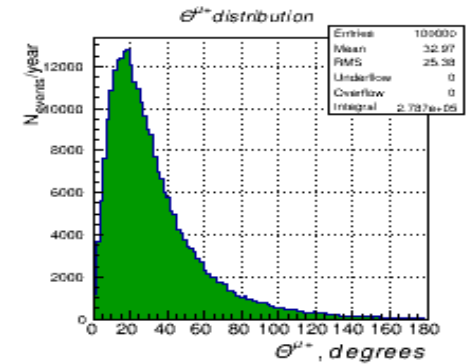
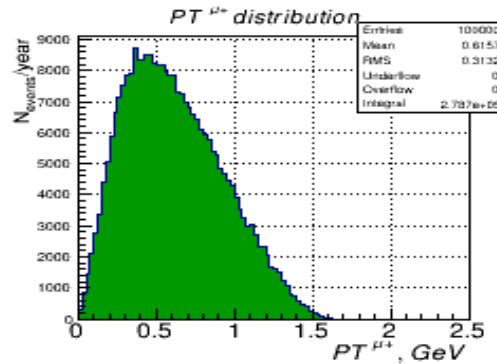
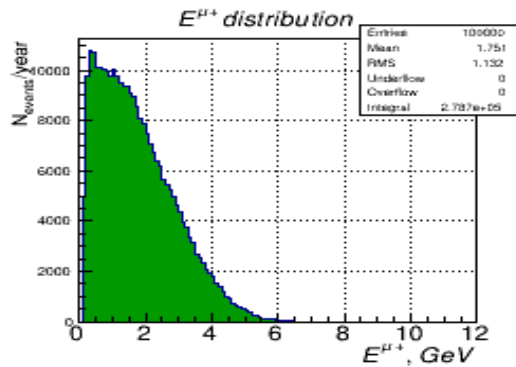


9.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	10558	1378	871	1087	13783	1378	1004	1197
Nev/day	19179	2503	1582	1974	25038	2503	1823	2174
Nev/year	2876972	375494	237340	296198	3755759	375494	273582	326173



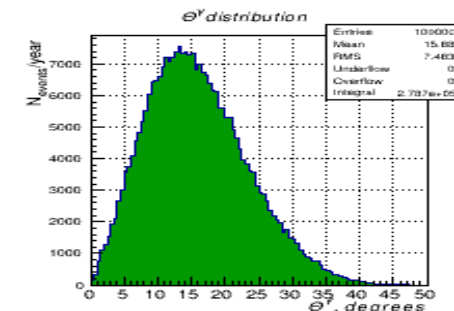
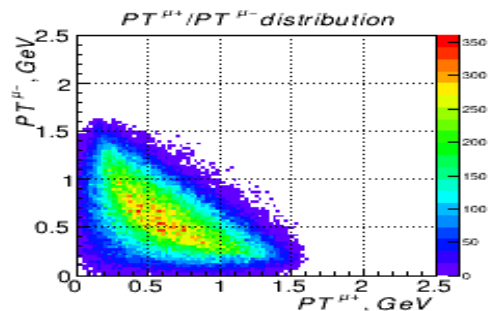
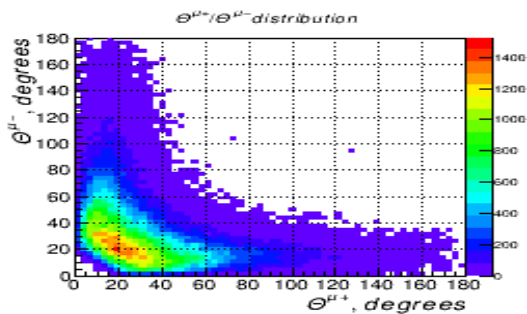
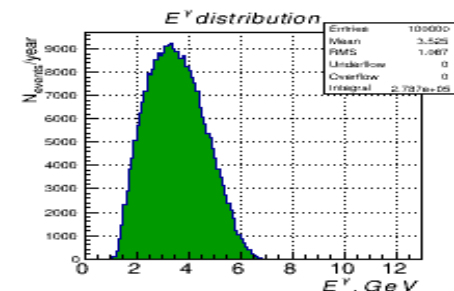
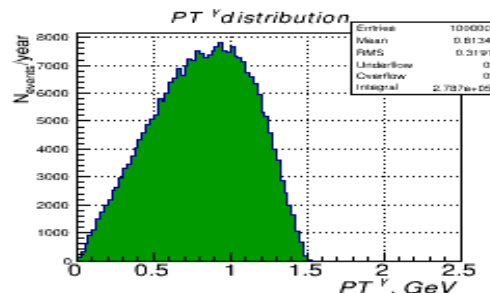
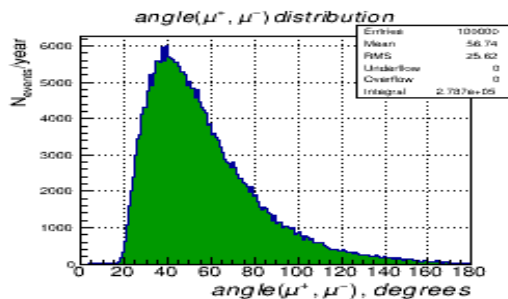


Muon distributions for $P_{\text{beam}} = 8.5 \text{ GeV}$ ($E_{\text{cms}} = 4.22 \text{ GeV}$, $\sigma = 1.559 \text{ nb}$)



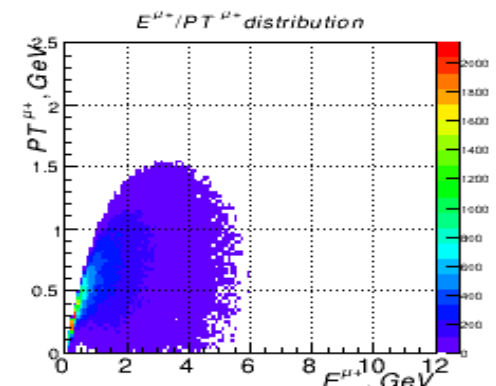
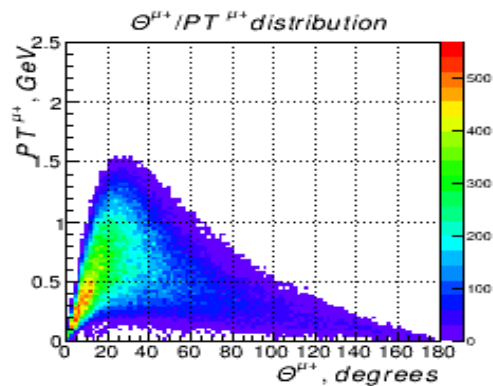
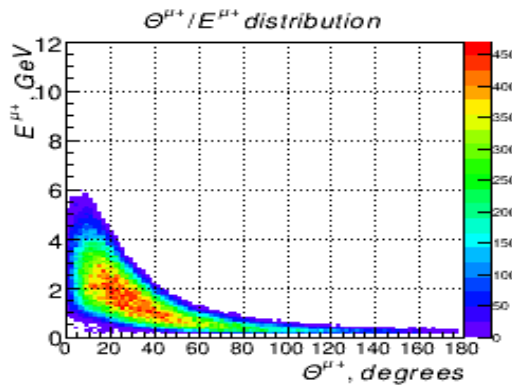
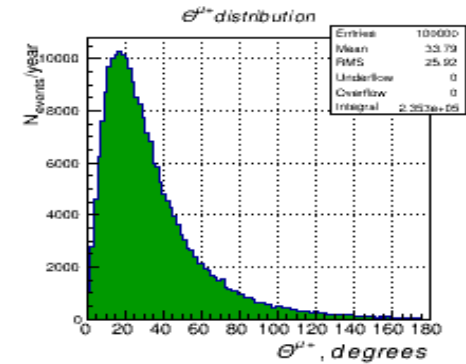
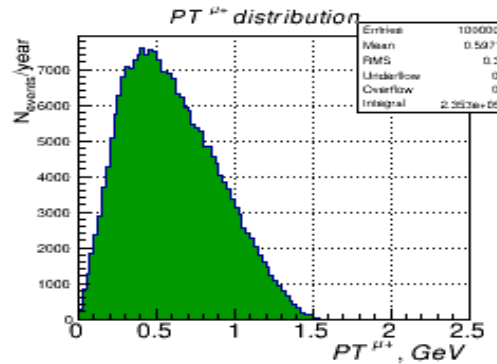
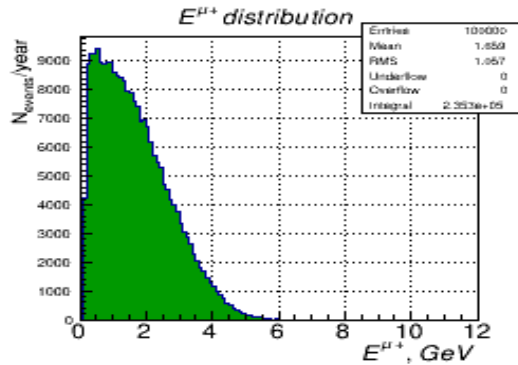


8.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	10311	1377	864	1080	13771	1377	998	1192
Nev/day	16073	2146	1346	1683	21467	2146	1555	1856
Nev/year	2411083	321992	202034	252542	3220156	321992	233368	278732



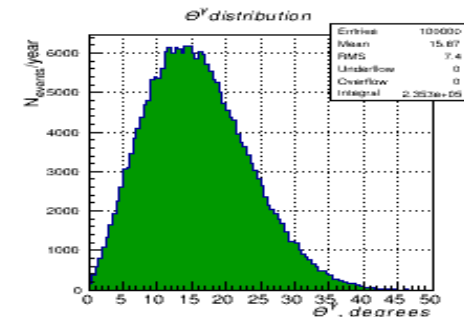
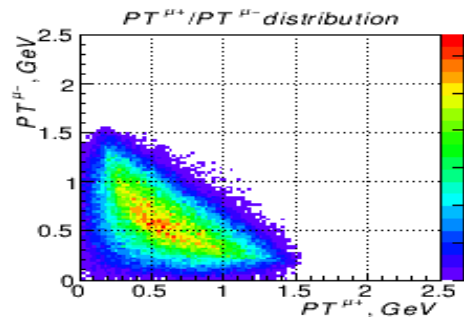
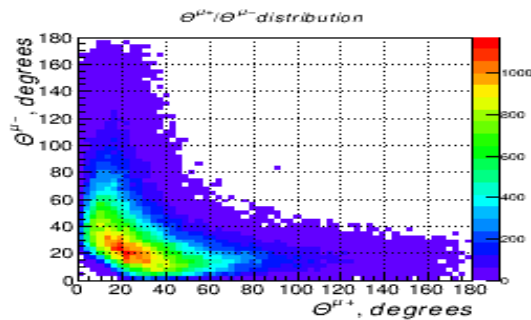
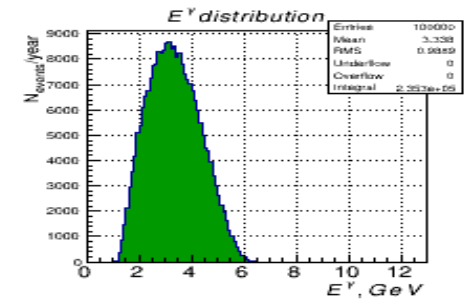
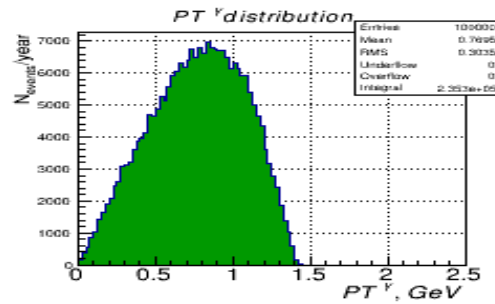
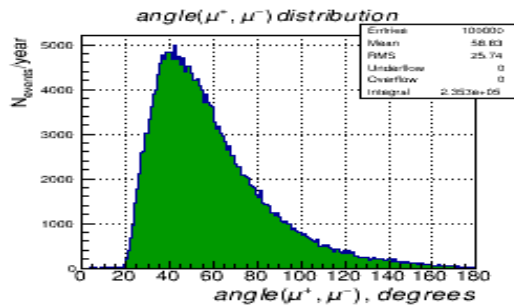


Muon distributions for $P_{\text{beam}} = 8.0 \text{ GeV}$ ($E_{\text{cms}} = 4.11 \text{ GeV}$, $\sigma = 1.322 \text{ nb}$)



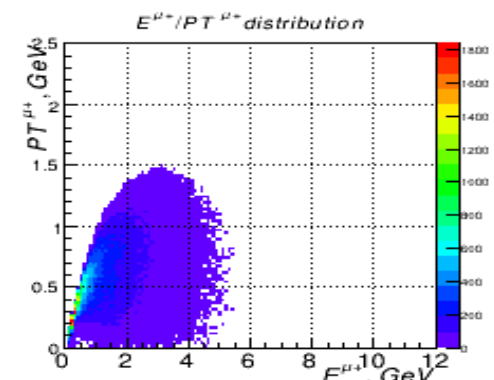
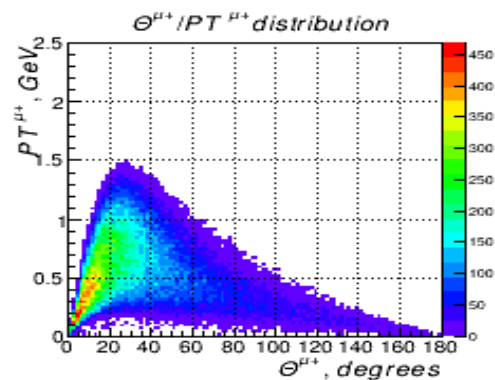
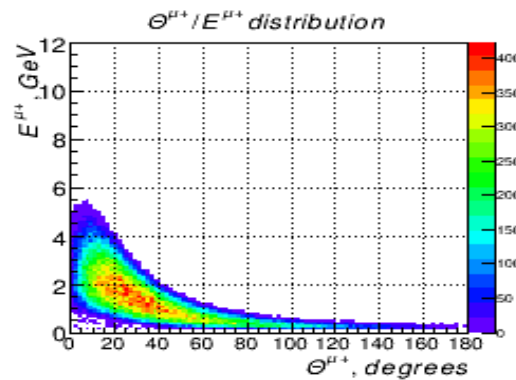
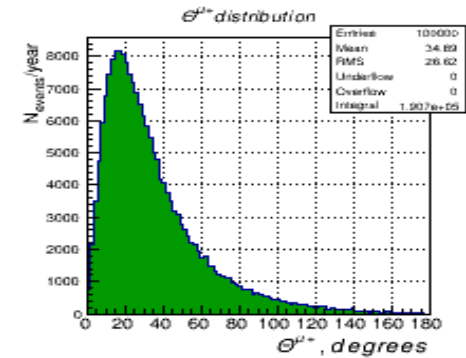
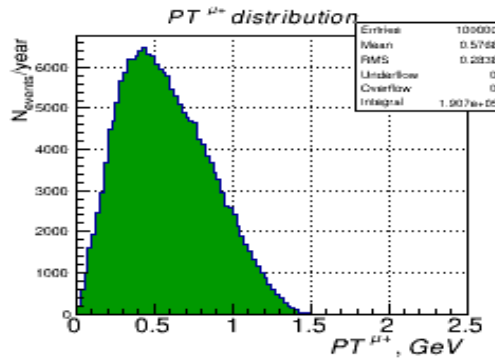
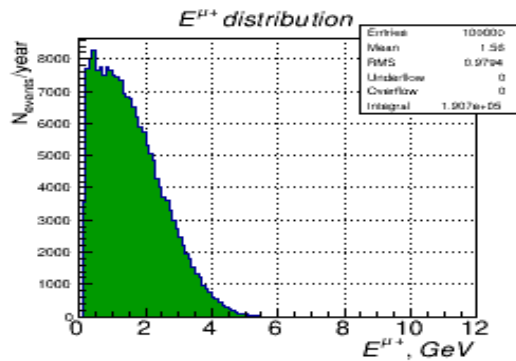


8.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	10045	1375	856	1073	13751	1375	990	1186
Nev/day	13283	1818	1132	1418	18184	1818	1309	1568
Nev/year	1992579	272752	169800	212845	2727721	272752	196381	235261



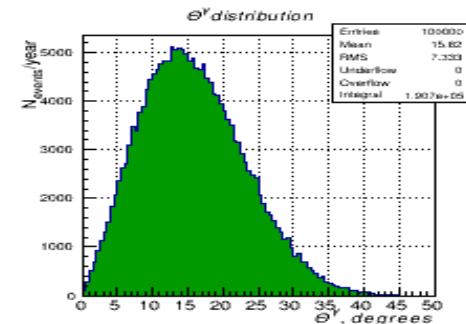
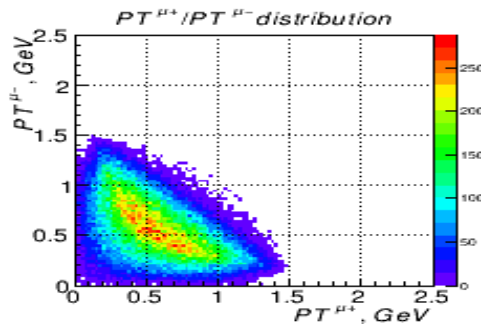
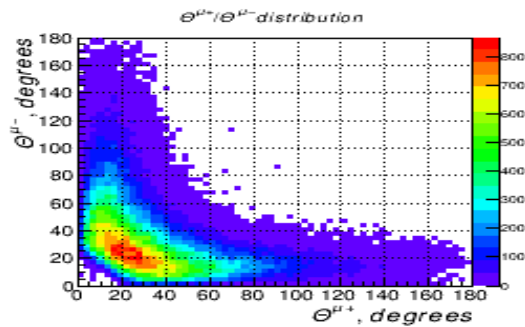
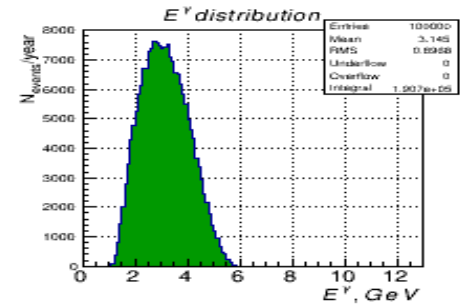
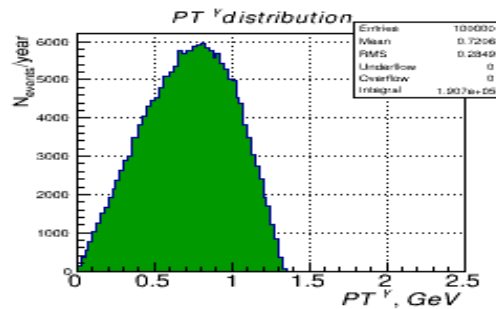
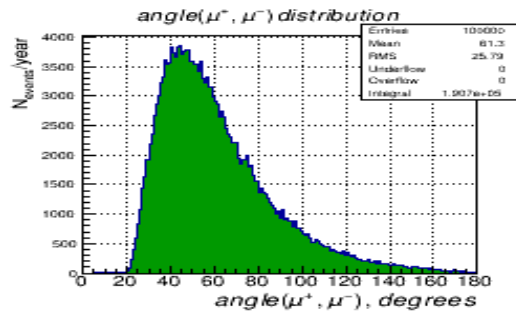


Muon distributions for $P_{\text{beam}} = 7.5 \text{ GeV}$ ($E_{\text{cms}} = 3.99 \text{ GeV}$, $\sigma = 1.078 \text{ nb}$)



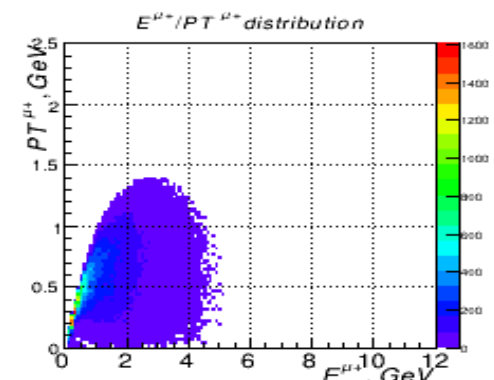
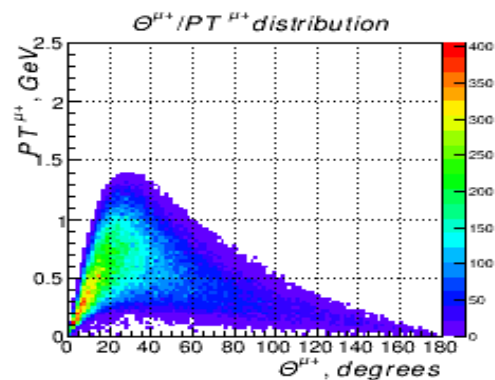
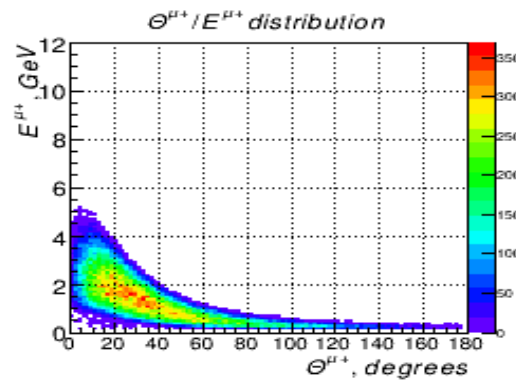
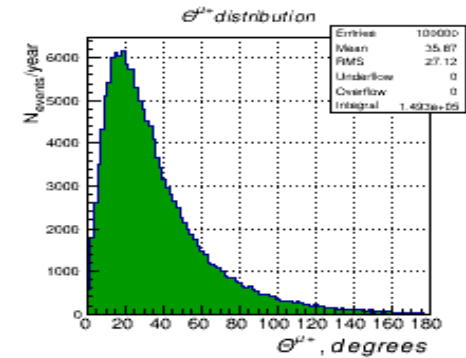
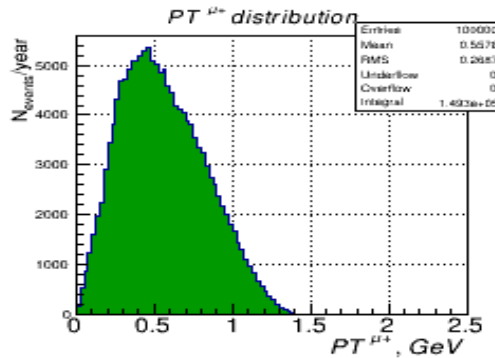
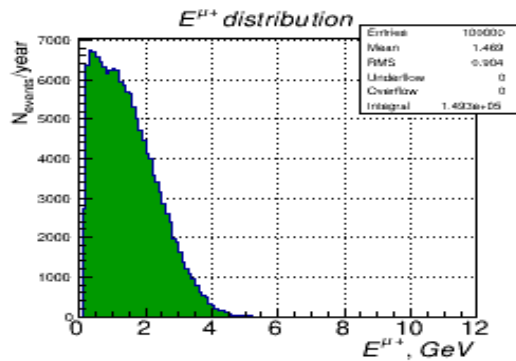


7.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	9760	1372	847	1063	13722	1372	982	1179
Nev/day	10526	1479	913	1146	14799	1479	1059	1271
Nev/year	1579002	221966	137030	171975	2219987	221966	158870	190742



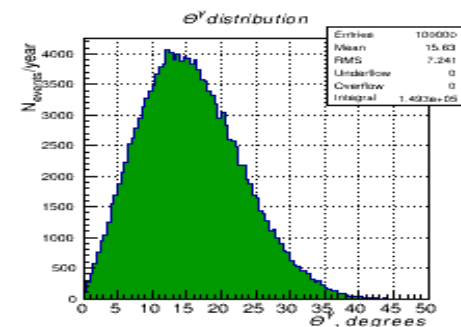
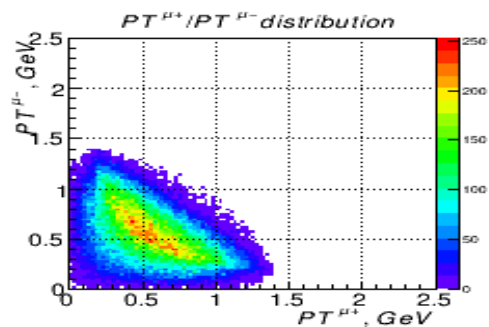
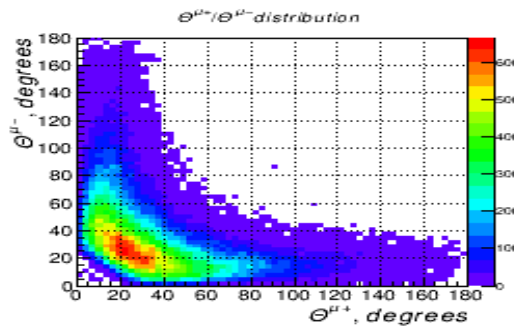
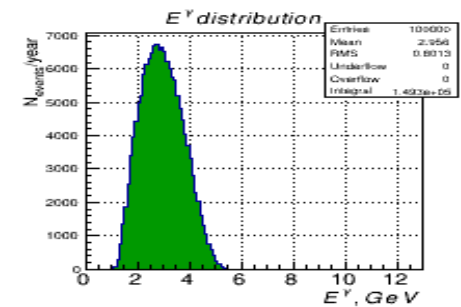
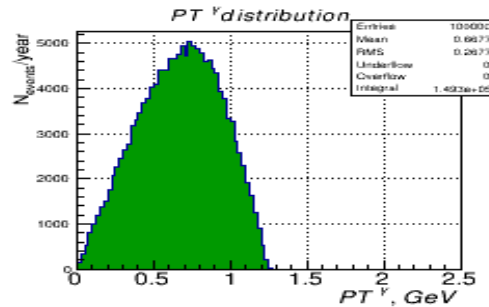
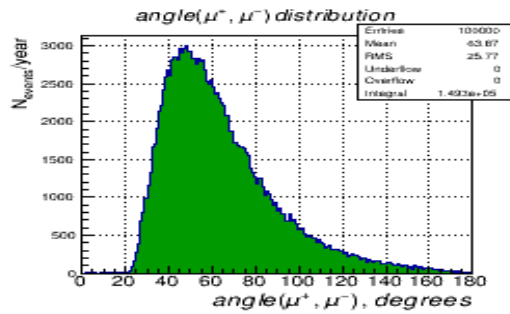


Muon distributions for $P_{\text{beam}} = 7.0 \text{ GeV}$ ($E_{\text{cms}} = 3.87 \text{ GeV}$, $\sigma = 8.50 \times 10^{-1} \text{ nb}$)



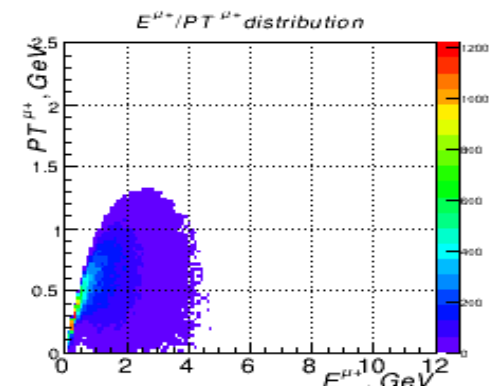
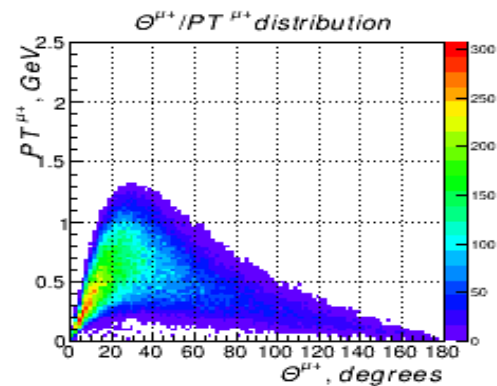
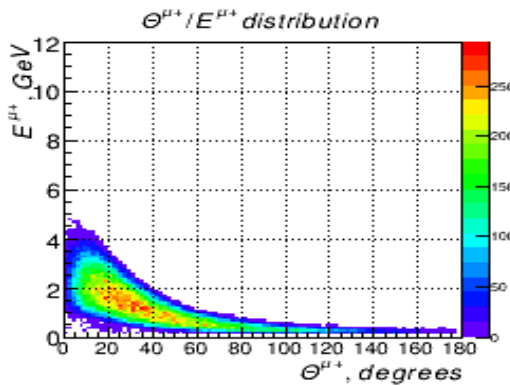
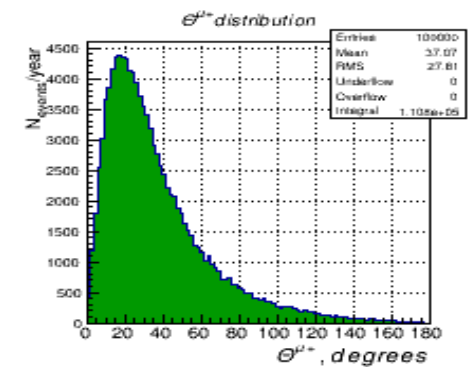
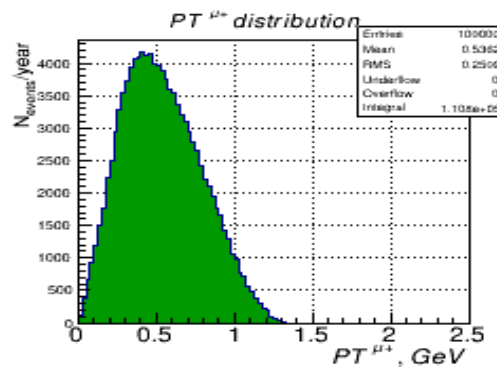
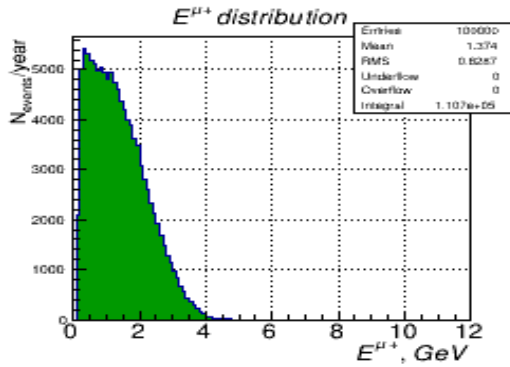


7.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	9451	1368	836	1053	13683	1368	972	1170
Nev/day	8038	1163	711	895	11637	1163	826	995
Nev/year	1205767	174530	106657	134342	1745690	174530	124008	149269



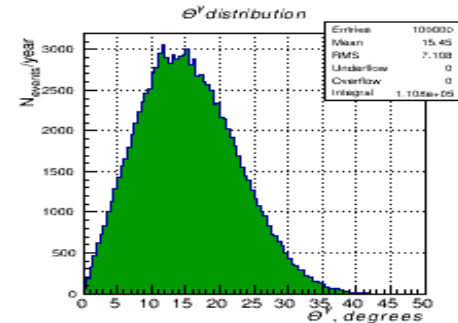
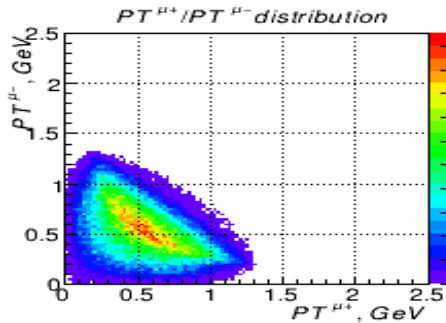
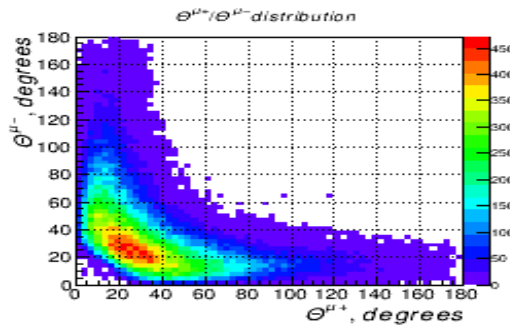
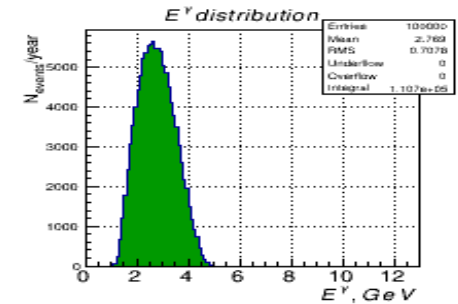
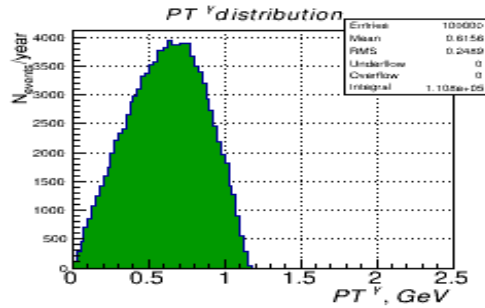
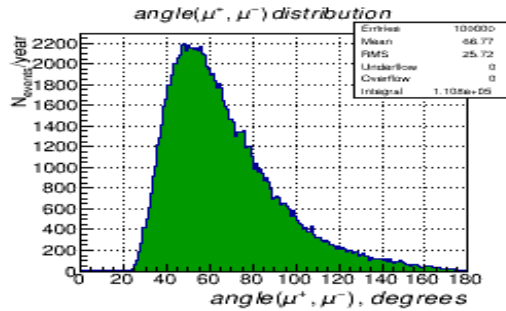


Muon distributions for $P_{\text{beam}} = 6.5 \text{ GeV}$ ($E_{\text{cms}} = 3.75 \text{ GeV}$, $\sigma = 6.36 \times 10^{-1} \text{ nb}$)



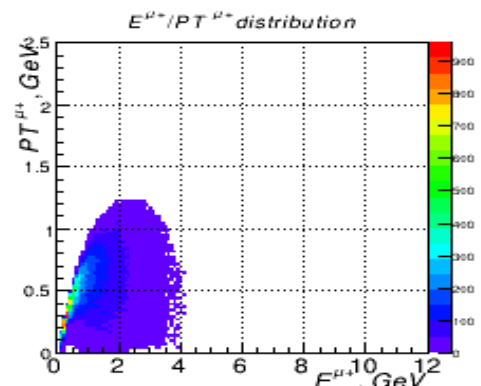
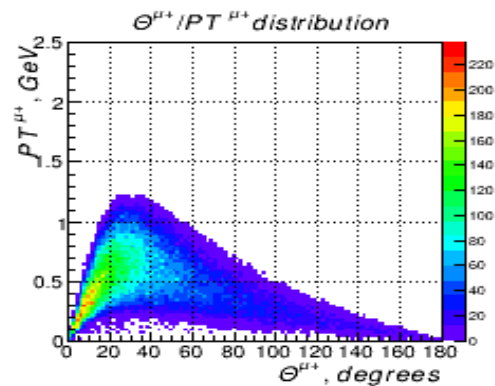
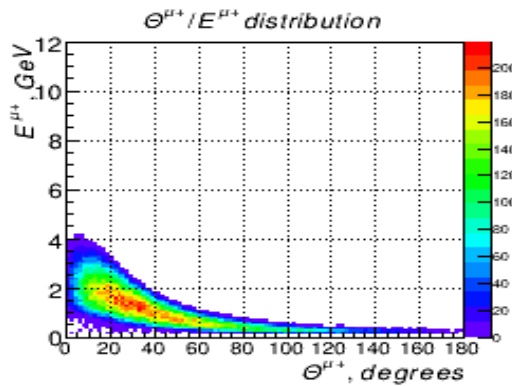
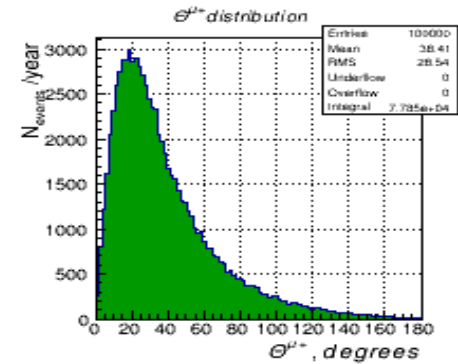
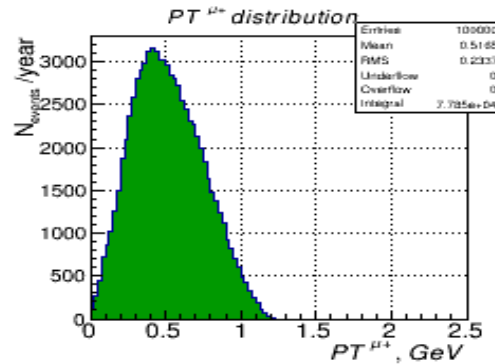
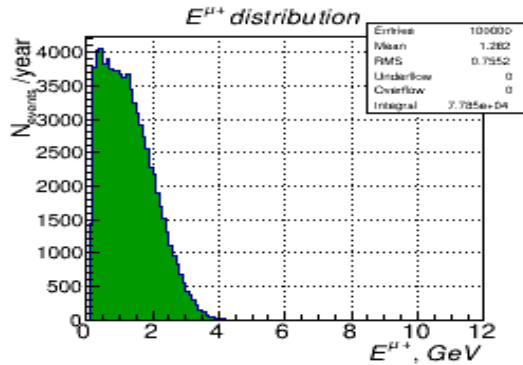


6.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	9118	1363	825	1041	13631	1363	961	1160
Nev/day	5803	867	525	662	8676	867	611	738
Nev/year	870558	130135	78768	99391	1301446	130135	91753	110753



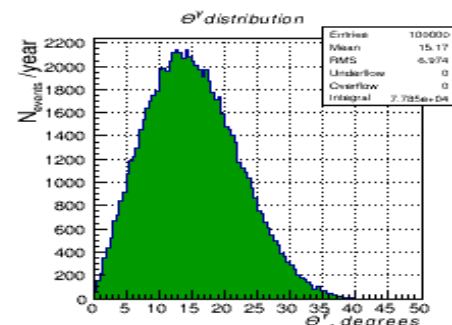
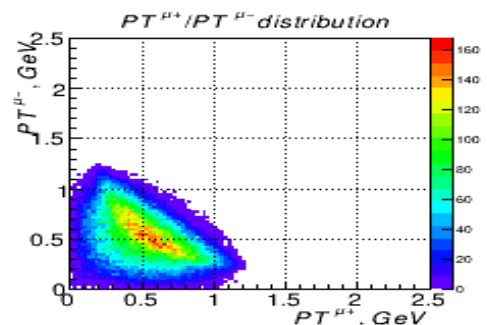
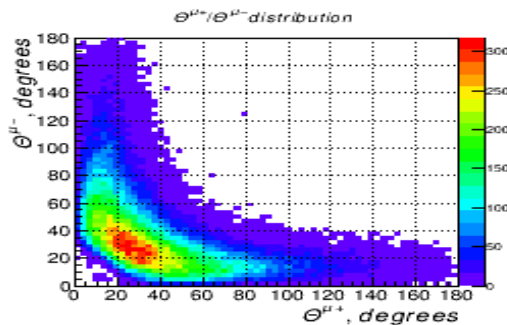
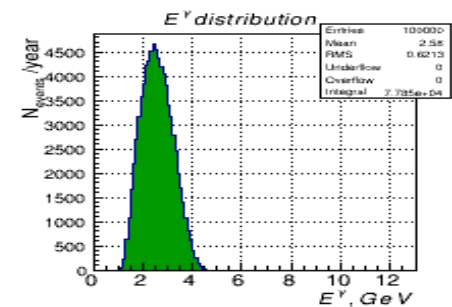
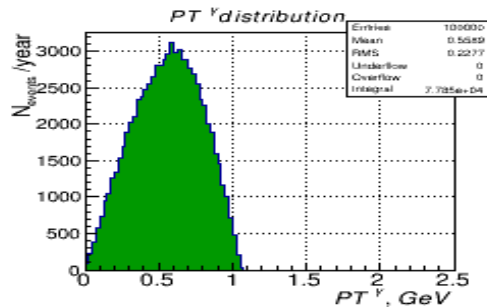
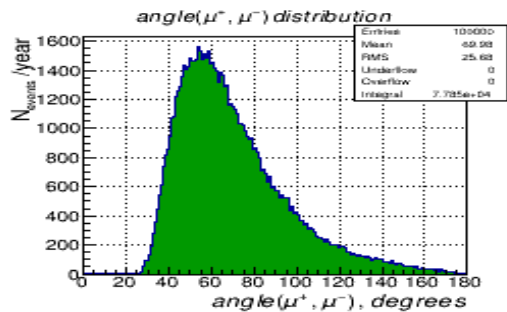


Muon distributions for $P_{\text{beam}} = 6.0 \text{ GeV}$ ($E_{\text{cms}} = 3.63 \text{ GeV}$, $\sigma = 4.52 \times 10^{-1} \text{ nb}$)



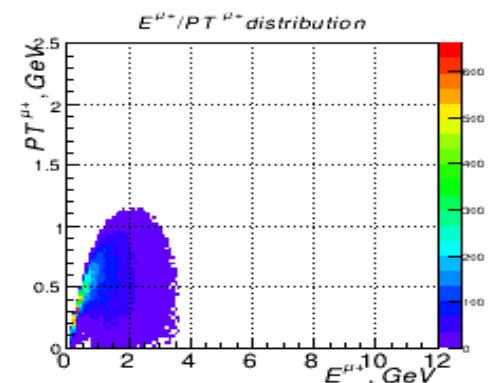
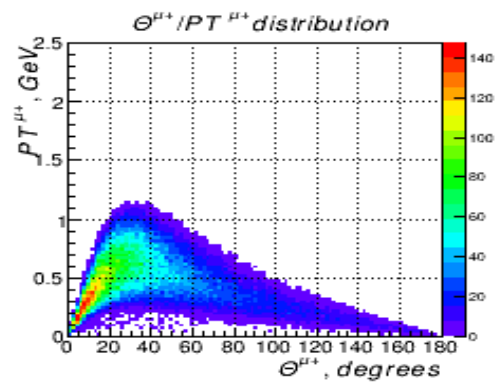
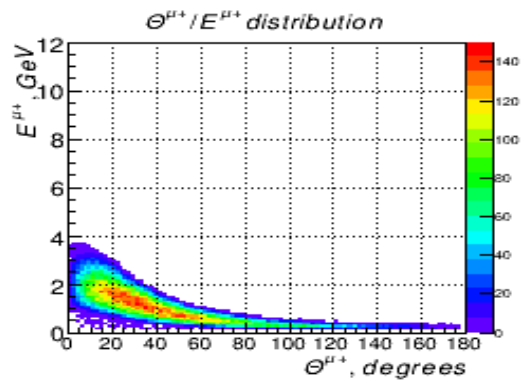
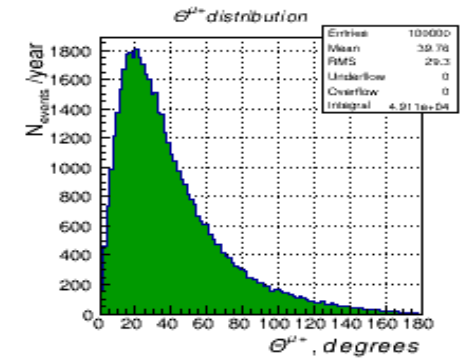
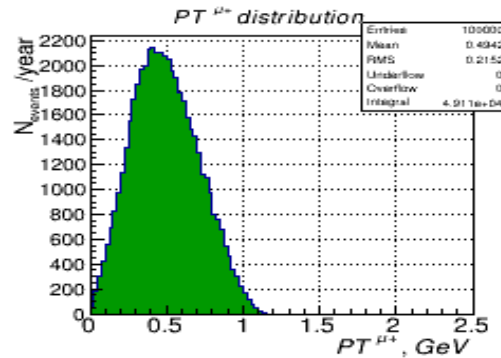
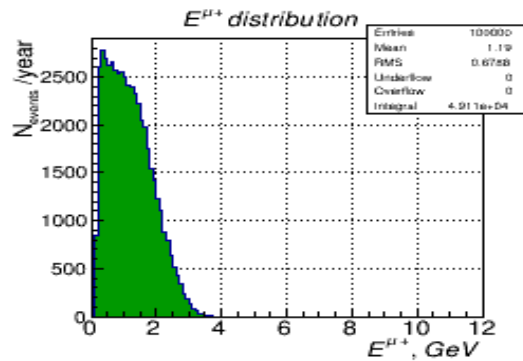


6.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	8758	1356	812	1026	13563	1356	948	1148
Nev/day	3959	613	367	463	6131	613	428	518
Nev/year	593895	91952	55063	69574	919730	91952	64285	77847



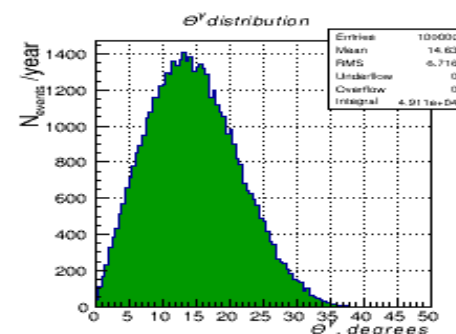
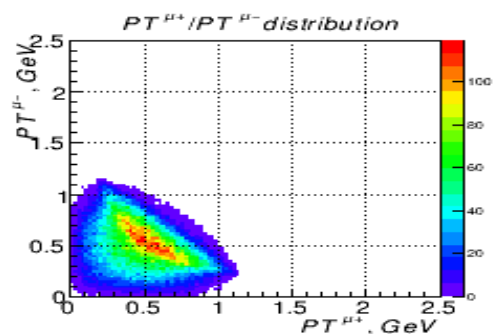
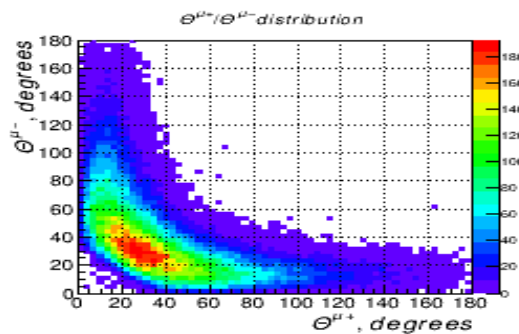
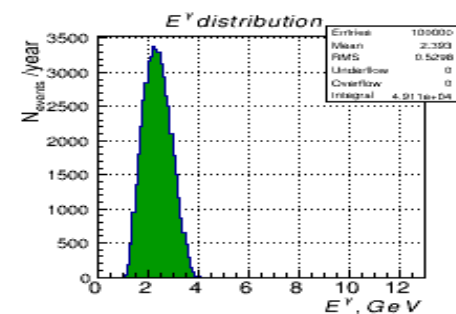
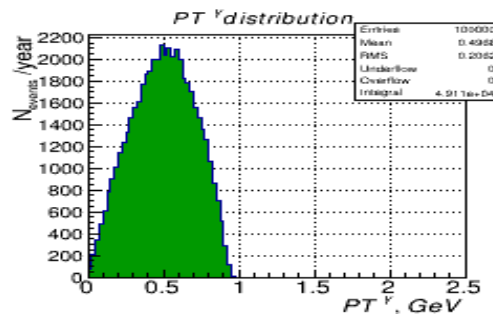
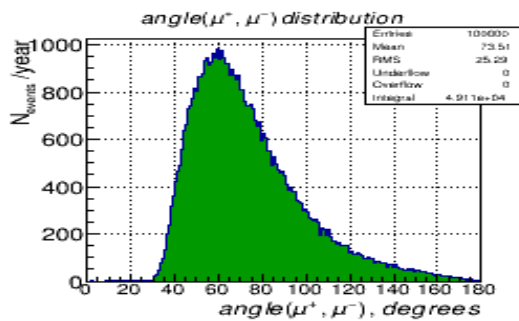


Muon distributions for $P_{\text{beam}} = 5.5 \text{ GeV}$ ($E_{\text{cms}} = 3.49 \text{ GeV}$, $\sigma = 2.89 \times 10^{-1} \text{ nb}$)



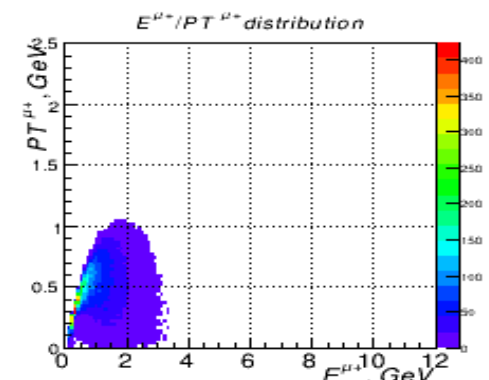
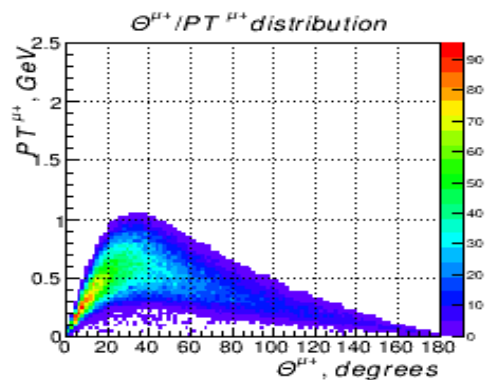
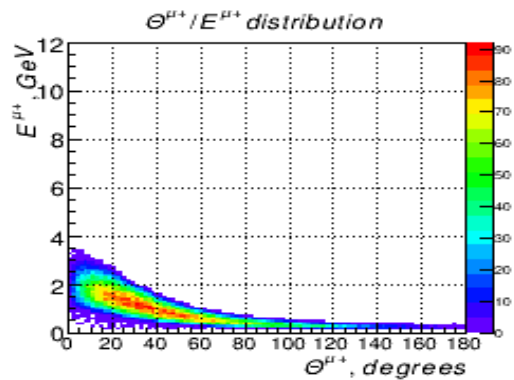
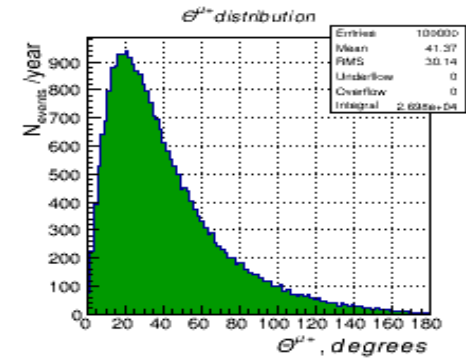
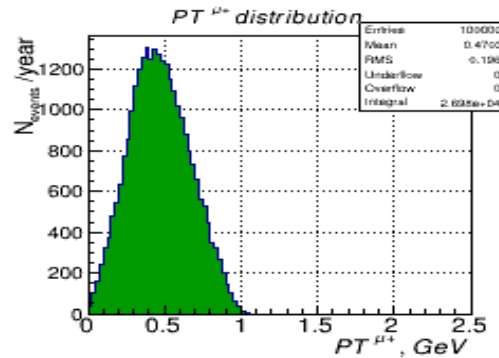
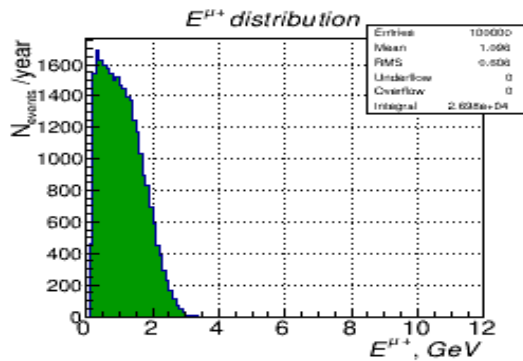


5.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	8368	1348	796	1010	13475	1348	933	1133
Nev/day	2418	389	230	291	3894	389	269	327
Nev/year	362745	58434	34505	43782	584130	58434	40444	49114



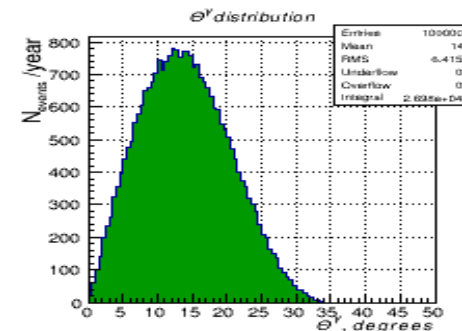
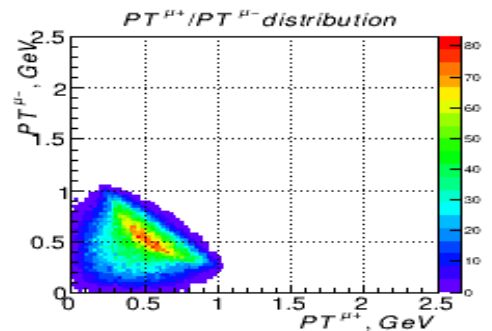
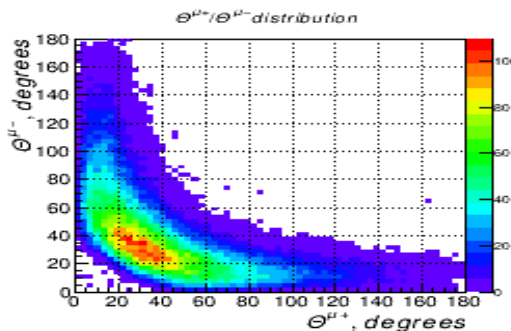
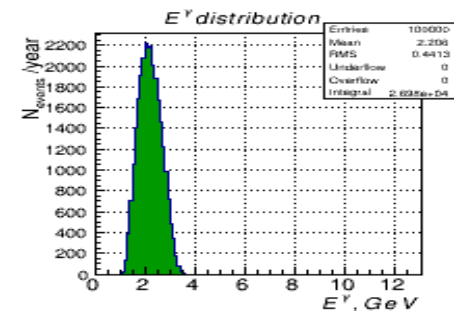
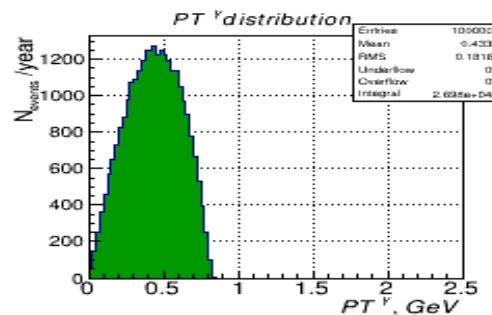
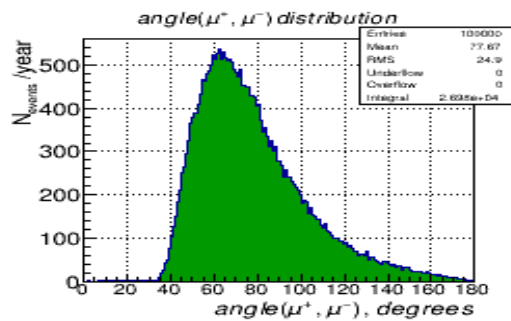


Muon distributions for $P_{\text{beam}} = 5.0 \text{ GeV}$ ($E_{\text{cms}} = 3.36 \text{ GeV}$, $\sigma = 1.61 \times 10^{-1} \text{ nb}$)



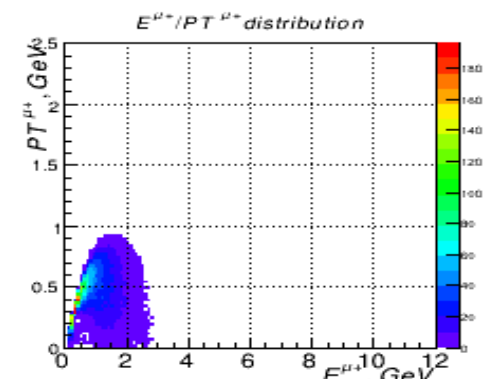
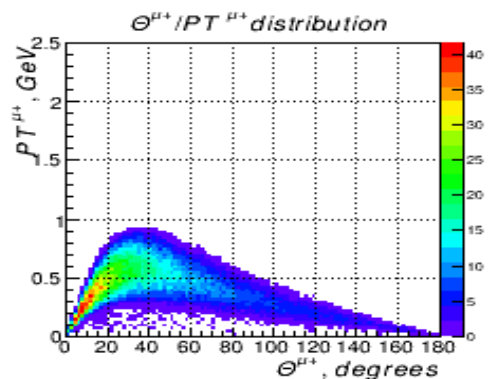
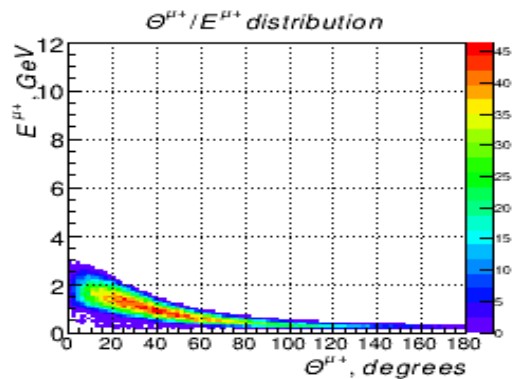
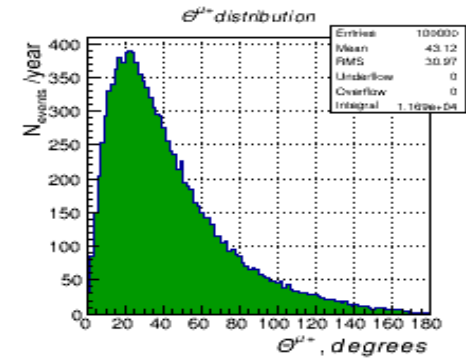
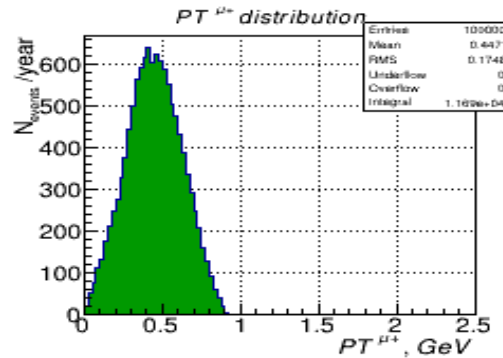
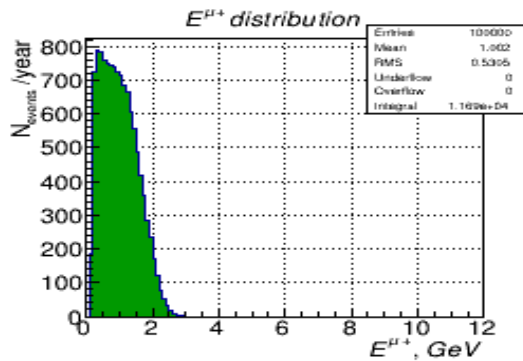


5.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	7944	1336	779	990	13363	1336	916	1116
Nev/day	1280	215	125	159	2153	215	147	179
Nev/year	192026	32294	18830	23930	323017	32294	22142	26976



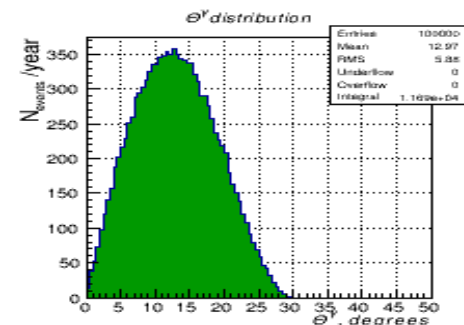
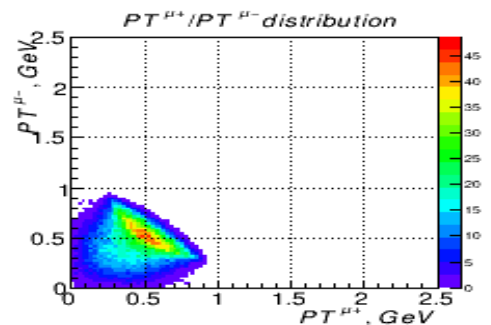
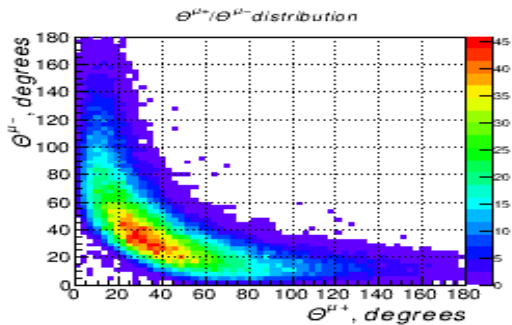
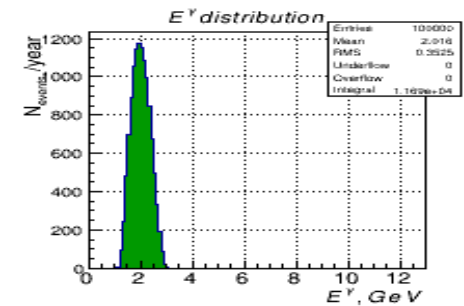
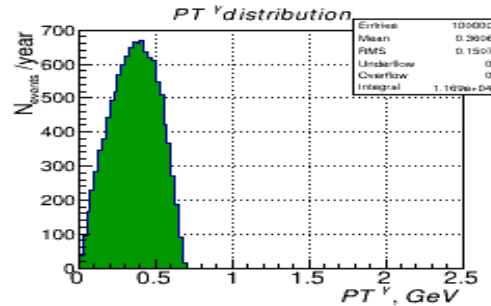
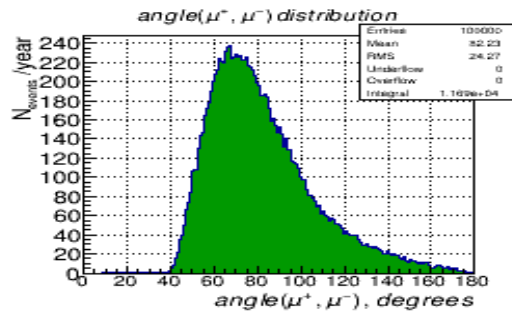


Muon distributions for $P_{\text{beam}} = 4.5 \text{ GeV}$ ($E_{\text{cms}} = 3.22 \text{ GeV}$, $\sigma = 7.11 \times 10^{-2} \text{ nb}$)



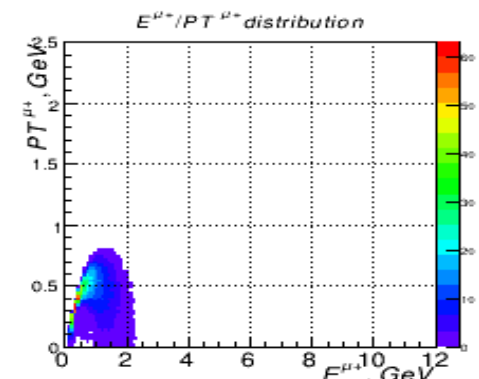
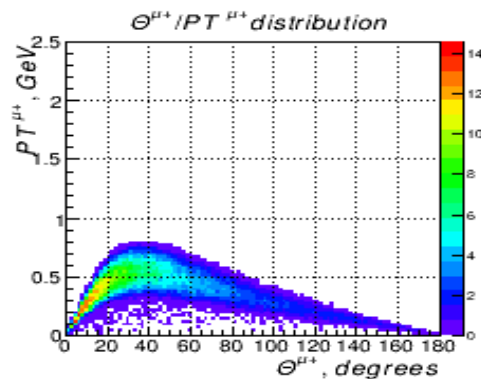
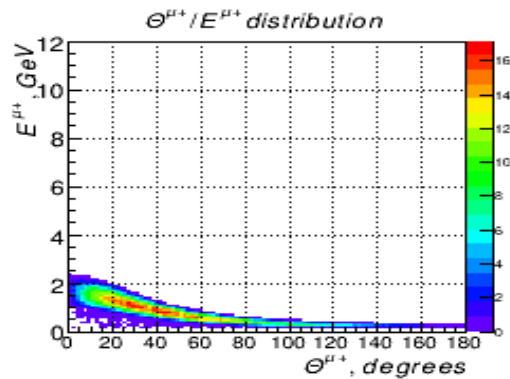
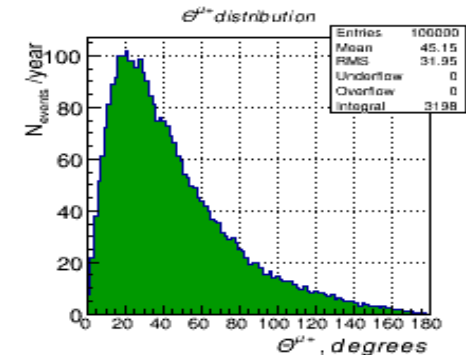
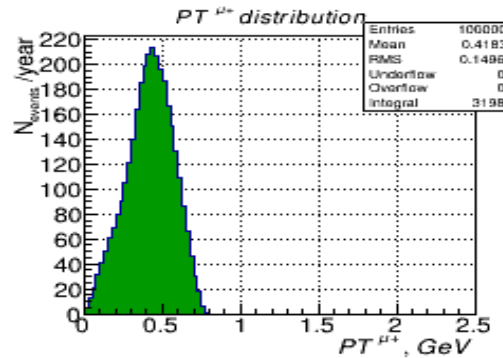
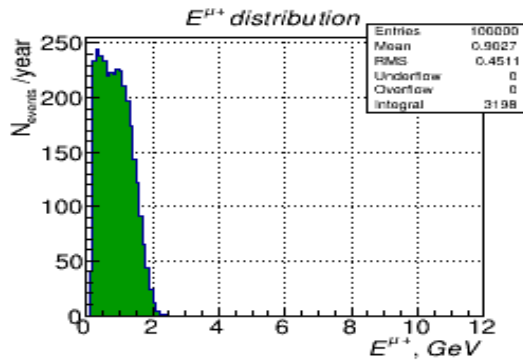


4.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	7482	1322	759	967	13123	1322	895	1095
Nev/day	532	94	53	68	933	94	63	77
Nev/year	79844	14107	8099	10319	140042	14107	9551	11685



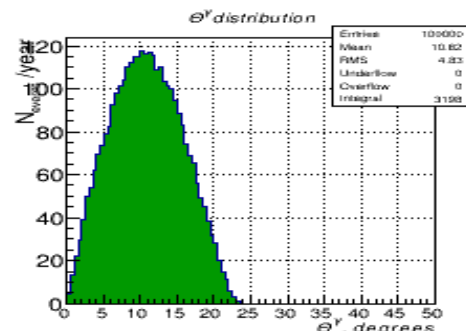
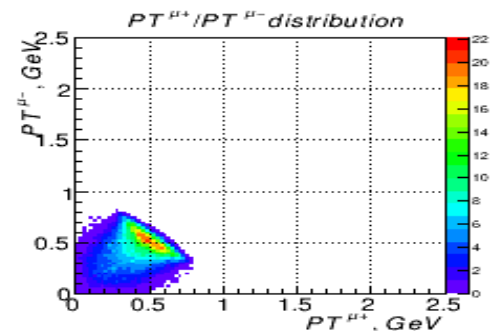
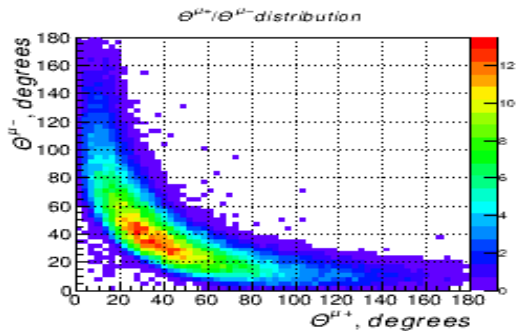
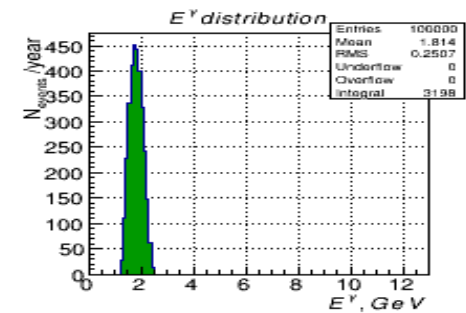
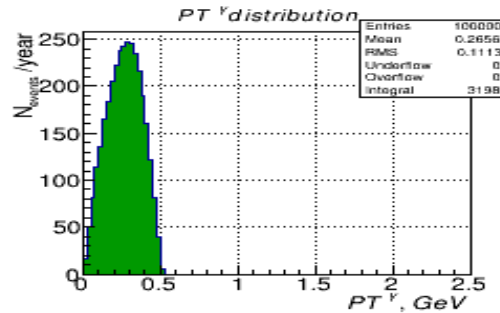
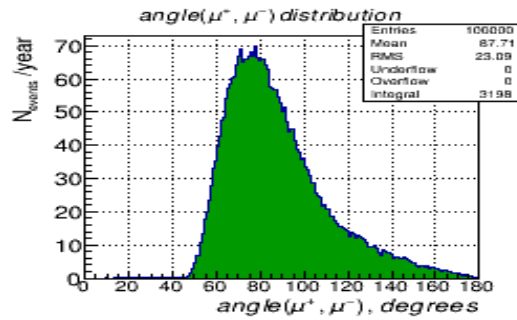


Muon distributions for $P_{\text{beam}} = 4.0 \text{ GeV}$ ($E_{\text{cms}} = 3.08 \text{ GeV}$, $\sigma = 1.99 \times 10^{-2} \text{ nb}$)



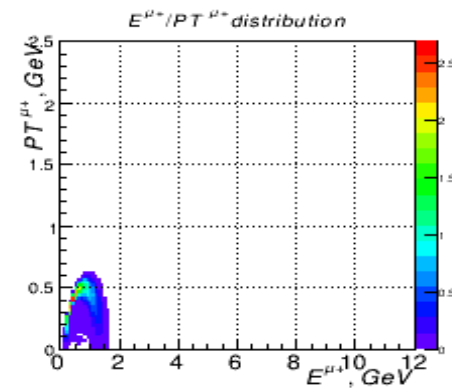
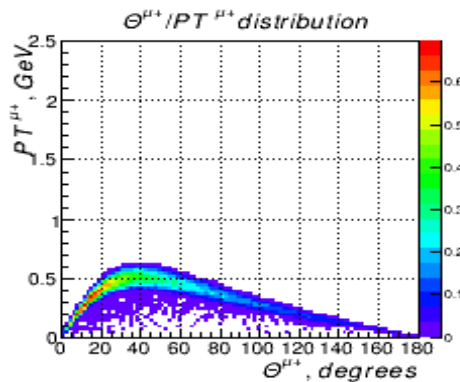
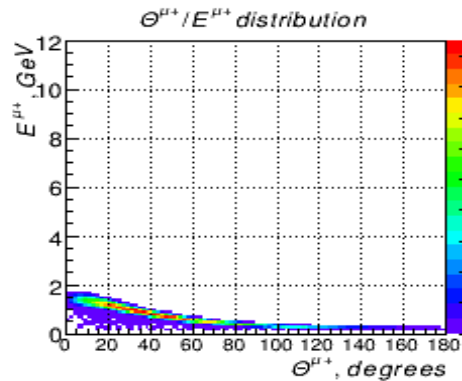
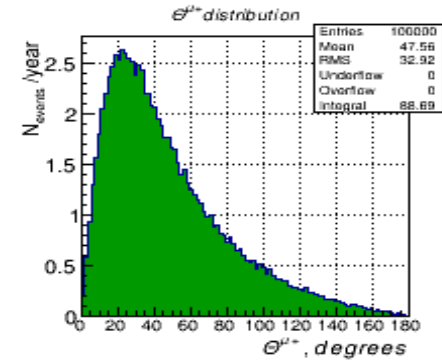
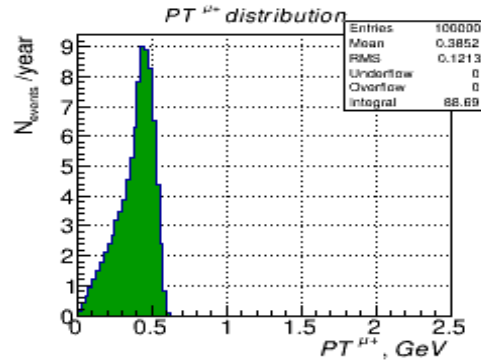
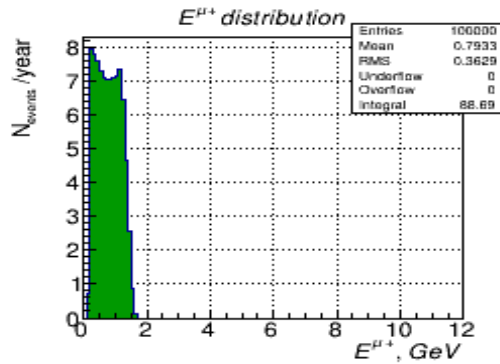


4.0 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [10 ⁷ /s]	1	1	0.56	0.56	2	2	1	1
Lum/day	6978	1304	735	940	12662	1304	871	1070
Nev/day	139	25	14	18	252	25	17	21
Nev/year	20853	3897	2196	2809	37840	3897	2603	3197





Muon distributions for $P_{\text{beam}} = 3.5 \text{ GeV}$ ($E_{\text{cms}} = 2.92 \text{ GeV}$, $\sigma = 5.93 \times 10^{-4} \text{ nb}$)





3.5 GeV	HL	HR	HESR	HESRr	HL	HR	HESR	HESRr
R [$10^7/s$]	1	1	0.56	0.56	2	2	1	1
Lum/day	6167	1230	679	870	11493	1230	809	997
Nev/day	3.6	0.7	0.4	0.5	6.8	0.7	0.5	0.6
Nev/year	548	109	60	77	1022	109	71	88

