

Update on Generated Information

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2013/09/18
GlueX Offline Meeting

Motivation and Status

- Could not find η' , ω , etc in generated info
- Need to work on definition of what is “primary”, which particles are to be saved in data stream
- Beni put in fix for η' , ω , Φ to be decayed in GEANT

Run Over bggen Events

- For IM events, many $\eta', \omega, \phi, \Lambda, \Sigma, X$ events found (there are no measurements for Ω , but expected cross sections are low)

For IM events

η'	31,719
ω	232,782
ϕ	11,300
Λ	50,773
Σ	16421
Ξ	68
Ω	0

Process Events

- bggen → hdgeant → mcsmear → REST
- All hd_dump output from hdgeant and mcsmear are same
- While running REST, I get warnings:

```
DReferenceTrajectory.cc:943 "hit" passed to DistToRT(DVector3) out of range!  
DReferenceTrajectory.cc:944 hit x,y,z = -75.7957, -29.3729, 290.483 Nswim_steps=667 min_delta2=4.77801e+07  
DReferenceTrajectory.cc:943 "hit" passed to DistToRT(DVector3) out of range!  
DReferenceTrajectory.cc:944 hit x,y,z = 17.7133, 63.0157, 262.13 Nswim_steps=667 min_delta2=4.95753e+07  
DReferenceTrajectory.cc:943 "hit" passed to DistToRT(DVector3) out of range!  
DReferenceTrajectory.cc:944 hit x,y,z = -60.5629, 28.9094, 123.161 Nswim_steps=667 min_delta2=4.84722e+07  
DReferenceTrajectory.cc:943 "hit" passed to DistToRT(DVector3) out of range!
```

hd_dump for η' Events

Event: 15
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	0.0	0.0	0.0	5.3156	0.000	5.305	3.489	113.196	-2	1	0	12
0	Unknown	+0	0.0	0.0	0.0	1.6841	0.000	1.651	11.084	56.837	2	2	0	11
0	Unknown	+0	0.0	0.0	0.0	2.1149	0.000	2.089	8.890	-66.804	2	3	0	12
0	Unknown	+0	0.0	0.0	0.0	0.6734	0.000	0.343	112.325	-123.163	2101	4	0	11
0	Unknown	+0	0.0	0.0	0.0	6.9997	0.000	6.939	4.665	85.272	91	5	1	11
34	EtaPrime	+0	0.0	0.0	0.0	7.0579	0.000	6.993	4.560	84.909	331	6	5	1
0	Unknown	+0	0.0	0.0	0.0	2.0589	0.000	2.034	8.890	-66.804	2	7	3	12
0	Unknown	+0	0.0	0.0	0.0	0.6712	0.000	0.342	112.325	-123.163	2101	8	4	11
0	Unknown	+0	0.0	0.0	0.0	2.7301	0.000	1.960	16.481	-95.091	91	9	7	11
14	Proton	+1	0.0	0.0	0.0	1.8087	0.000	1.546	14.765	-64.100	2212	10	9	1
33	omega	+0	0.0	0.0	0.0	0.9214	0.000	0.486	37.805	-138.017	223	11	9	1

bggen

Event: 15
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	-0.1	0.1	70.8	5.3156	0.000	5.305	3.489	113.196	-2	1	0	12
0	Unknown	+0	-0.1	0.1	70.8	1.6841	0.000	1.651	11.084	56.837	2	2	0	11
0	Unknown	+0	-0.1	0.1	70.8	2.1149	0.000	2.089	8.890	-66.804	2	3	0	12
0	Unknown	+0	-0.1	0.1	70.8	0.6734	0.000	0.343	112.325	-123.163	2101	4	0	11
0	Unknown	+0	-0.1	0.1	70.8	6.9997	0.000	6.939	4.665	85.272	91	5	1	11
34	EtaPrime	+0	-0.1	0.1	70.8	7.0579	0.000	6.993	4.560	84.909	331	6	5	1
0	Unknown	+0	-0.1	0.1	70.8	2.0589	0.000	2.034	8.890	-66.804	2	7	3	12
0	Unknown	+0	-0.1	0.1	70.8	0.6712	0.000	0.342	112.325	-123.163	2101	8	4	11
0	Unknown	+0	-0.1	0.1	70.8	2.7301	0.000	1.960	16.481	-95.091	91	9	7	11
14	Proton	+1	-0.1	0.1	70.8	1.8087	0.000	1.546	14.765	-64.100	2212	10	9	1
33	omega	+0	-0.1	0.1	70.8	0.9214	0.000	0.486	37.805	-138.017	223	11	9	1
9	Pi-	-1	-0.1	0.1	70.8	0.2390	0.000	0.194	35.609	-44.254	-211	12	11	1497449284
8	Pi+	+1	-0.1	0.1	70.8	0.5029	0.000	0.483	57.434	-172.639	211	13	11	1497449284
7	Pi0	+0	-0.1	0.1	70.8	0.1852	0.000	0.127	105.444	-33.946	111	14	11	1497449284
1	Photon	+0	-0.1	0.1	70.8	0.0409	0.000	0.041	96.811	75.953	22	15	14	1497449284
1	Photon	+0	-0.1	0.1	70.8	0.1443	0.000	0.144	101.565	-49.626	22	16	14	1497449284
6	Muon-	-1	-28.2	-7.6	297.6	0.1414	0.000	0.094	34.332	68.445	13	17	12	1497449284
4	Neutrino	+0	-28.2	-7.6	297.6	0.0804	0.000	0.080	49.226	82.183	121416	18	12	1497449284
3	Electron	-1	-16.9	-103.7	620.6	0.0320	0.000	0.032	61.230	170.246	11	19	17	1497449284
4	Neutrino	+0	-16.9	-103.7	620.6	0.0473	0.000	0.047	128.983	-46.549	121416	20	17	1497449284
4	Neutrino	+0	-16.9	-103.7	620.6	0.0263	0.000	0.026	56.974	83.813	121416	21	17	1497449284
5	Muon+	+1	60.9	-31.3	333.4	0.1392	0.000	0.091	58.088	-9.589	-13	22	-1	1497449284
4	Neutrino	+0	60.9	-31.3	333.4	0.0746	0.000	0.075	43.537	13.518	121416	23	-1	1497449284
12	K-	-1	-0.1	0.1	70.8	3.5557	0.000	3.521	6.604	90.062	-321	24	6	1497449284
11	K+	+1	-0.1	0.1	70.8	3.5109	0.000	3.476	2.587	71.504	321	25	6	1497449284
5	Muon+	+1	1.2	7.4	234.7	2.1174	0.000	2.115	5.926	2.919	-13	26	0	1497449284
4	Neutrino	+0	1.2	7.4	234.7	1.3904	0.000	1.390	10.787	145.655	121416	27	0	1497449284
6	Muon-	-1	65.4	155.9	1827.1	2.9451	0.000	2.943	7.412	77.419	13	28	0	1497449284
4	Neutrino	+0	65.4	155.9	1827.1	0.3488	0.000	0.349	21.007	-68.647	121416	29	0	1497449284

hdgeant

DCAY

wrong!

hd dump for η' Events

Event: 161

DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	0.0	0.0	0.0	7.0024	0.000	6.995	3.884	7.977	2	1	0	12
0	Unknown	+0	0.0	0.0	0.0	0.6668	0.000	0.330	72.233	140.407	2101	2	0	11
0	Unknown	+0	0.0	0.0	0.0	1.0983	0.000	1.048	26.890	-172.023	-2	3	0	12
0	Unknown	+0	0.0	0.0	0.0	0.6556	0.000	0.567	33.710	-39.593	2	4	0	11
0	Unknown	+0	0.0	0.0	0.0	1.7539	0.000	1.448	13.973	-130.450	91	5	3	11
0	Unknown	+0	0.0	0.0	0.0	1.2767	0.000	1.054	13.973	-130.450	113	6	5	11
0	Unknown	+0	0.0	0.0	0.0	7.0024	0.000	6.995	3.884	7.977	2	7	1	12
0	Unknown	+0	0.0	0.0	0.0	0.4772	0.000	0.394	13.973	-130.450	21	8	5	12
0	Unknown	+0	0.0	0.0	0.0	0.6668	0.000	0.330	72.233	140.407	2101	9	2	11
9	Pi-	-1	0.0	0.0	0.0	0.9695	0.000	0.959	1.557	-16.900	-211	10	6	1
8	Pi+	+1	0.0	0.0	0.0	0.3072	0.000	0.274	76.460	-135.603	211	11	6	1
0	Unknown	+0	0.0	0.0	0.0	8.1464	0.000	7.466	1.954	49.550	92	12	7	11
34	EtaPrime	+0	0.0	0.0	0.0	4.6638	0.000	4.564	2.536	44.924	331	13	12	1
0	Unknown	+0	0.0	0.0	0.0	1.3896	0.000	1.155	9.872	37.754	323	14	12	11
18	Lambda	+0	0.0	0.0	0.0	2.0930	0.000	1.771	4.909	-152.446	3122	15	12	1
0	Unknown	+0	0.0	0.0	0.0	0.9605	0.000	0.822	8.915	131.257	311	16	14	11
8	Pi+	+1	0.0	0.0	0.0	0.4291	0.000	0.406	36.577	6.051	211	17	14	1
16	KShort	+0	0.0	0.0	0.0	0.9605	0.000	0.822	8.915	131.257	310	18	16	1

bggen

Event: 161

DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	-0.0	0.2	50.2	7.0024	0.000	6.995	3.884	7.977	2	1	0	12
0	Unknown	+0	-0.0	0.2	50.2	0.6668	0.000	0.330	72.233	140.407	2101	2	0	11
0	Unknown	+0	-0.0	0.2	50.2	1.0983	0.000	1.048	26.890	-172.023	-2	3	0	12
0	Unknown	+0	-0.0	0.2	50.2	0.6556	0.000	0.567	33.710	-39.593	2	4	0	11
0	Unknown	+0	-0.0	0.2	50.2	1.7539	0.000	1.448	13.973	-130.450	91	5	3	11
0	Unknown	+0	-0.0	0.2	50.2	1.2767	0.000	1.054	13.973	-130.450	113	6	5	11
0	Unknown	+0	-0.0	0.2	50.2	7.0024	0.000	6.995	3.884	7.977	2	7	1	12
0	Unknown	+0	-0.0	0.2	50.2	0.4772	0.000	0.394	13.973	-130.450	21	8	5	12
0	Unknown	+0	-0.0	0.2	50.2	0.6668	0.000	0.330	72.233	140.407	2101	9	2	11
9	Pi-	-1	-0.0	0.2	50.2	0.9695	0.000	0.959	1.557	-16.900	-211	10	6	1
8	Pi+	+1	-0.0	0.2	50.2	0.3072	0.000	0.274	76.460	-135.603	211	11	6	1
0	Unknown	+0	-0.0	0.2	50.2	8.1464	0.000	7.466	1.954	49.550	92	12	7	11
34	EtaPrime	+0	-0.0	0.2	50.2	4.6638	0.000	4.564	2.536	44.924	331	13	12	1
0	Unknown	+0	-0.0	0.2	50.2	1.3896	0.000	1.155	9.872	37.754	323	14	12	11
18	Lambda	+0	-0.0	0.2	50.2	2.0930	0.000	1.771	4.909	-152.446	3122	15	12	1
0	Unknown	+0	-0.0	0.2	50.2	0.9605	0.000	0.822	8.915	131.257	311	16	14	11
8	Pi+	+1	-0.0	0.2	50.2	0.4291	0.000	0.406	36.577	6.051	211	17	14	1
16	KShort	+0	-0.0	0.2	50.2	0.9605	0.000	0.822	8.915	131.257	310	18	16	1
8	Pi+	+1	-0.4	0.6	53.7	0.5139	-0.000	0.495	27.145	-164.710	211	19	18	1497449284
9	Pi-	-1	-0.4	0.6	53.7	0.4466	-0.000	0.424	28.877	49.255	-211	20	18	1497449284
6	Muon-	-1	128.3	116.8	645.1	0.2647	0.000	0.243	29.908	55.475	13	21	20	1497449284
4	Neutrino	+0	128.3	116.8	645.1	0.1204	0.000	0.120	39.166	26.808	121416	22	20	1497449284
14	Proton	+1	-0.3	0.1	53.2	1.7744	-0.000	1.506	8.656	-159.340	2212	23	15	1497449284
9	Pi-	-1	-0.3	0.1	53.2	0.3186	-0.000	0.286	15.878	7.238	-211	24	15	1497449284
7	Pi0	+0	-0.0	0.2	50.2	1.4385	-0.000	1.432	3.755	-147.639	111	25	13	1497449284
44	Rho-	-1	-0.0	0.2	50.2	3.2371	-0.000	3.145	5.369	40.948	-213	26	13	1497449284
7	Pi0	+0	-0.0	0.2	50.2	1.1719	-0.000	1.164	18.053	70.818	111	27	0	1497449284
7	Pi0	+0	-0.0	0.2	50.2	2.0365	-0.000	2.032	5.100	-54.967	111	28	0	1497449284
1	Photon	+0	-0.0	0.2	50.2	0.7232	-0.000	0.723	1.132	-139.804	22	29	0	1497449284
1	Photon	+0	-0.0	0.2	50.2	1.3134	-0.000	1.313	7.874	-50.431	22	30	0	1497449284
1	Photon	+0	-0.0	0.2	50.2	0.9923	-0.000	0.992	20.032	64.772	22	31	0	1497449284
1	Photon	+0	-0.0	0.2	50.2	0.1796	-0.000	0.180	13.659	128.376	22	32	0	1497449284
1	Photon	+0	-0.0	0.2	50.2	0.2825	-0.000	0.282	11.630	-77.789	22	33	0	1497449284
1	Photon	+0	-0.0	0.2	50.2	1.1560	-0.000	1.156	4.537	176.582	22	34	0	1497449284
5	Muon+	+1	-14.9	-25.2	126.9	0.1252	0.000	0.067	61.872	-70.185	-13	35	0	1497449284
4	Neutrino	+0	-14.9	-25.2	126.9	0.0509	0.000	0.051	69.048	-124.538	121416	36	0	1497449284
2	Positron	+1	-11.9	-19.7	149.4	0.0401	0.000	0.040	122.275	24.247	-11	37	0	1497449284
4	Neutrino	+0	-11.9	-19.7	149.4	0.0388	0.000	0.039	64.043	-110.610	121416	38	0	1497449284
4	Neutrino	+0	-11.9	-19.7	149.4	0.0268	0.000	0.027	80.549	134.739	121416	39	0	1497449284

hdgeant

wrong!

hd_dump for Φ Events

bggen

Event: 342
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
35	phiMeson	+0	0.0	0.0	0.0	8.8076	0.000	8.749	3.574	-14.261	333	1	0	1
14	Proton	+1	0.0	0.0	0.0	1.1139	0.000	0.600	65.274	165.739	2212	2	0	1

hdgeant

Event: 342
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
35	phiMeson	+0	-0.2	0.0	68.7	8.8076	0.000	8.749	3.574	-14.261	333	1	0	1
14	Proton	+1	-0.2	0.0	68.7	1.1139	0.000	0.600	65.274	165.739	2212	2	0	1
8	Pi+	+1	-0.2	0.0	68.7	1.6197	0.000	1.614	6.755	35.698	211	3	1	1497449284
9	Pi-	-1	-0.2	0.0	68.7	2.6825	0.000	2.679	3.978	-16.664	-211	4	1	1497449284
17	Eta	+0	-0.2	0.0	68.7	4.4991	0.000	4.466	3.524	-44.325	221	5	1	1497449284
7	Pi0	+0	-0.2	0.0	68.7	1.9189	0.000	1.914	3.891	-56.923	111	6	5	1497449284
7	Pi0	+0	-0.2	0.0	68.7	0.9921	0.000	0.983	9.268	14.021	111	7	5	1497449284
7	Pi0	+0	-0.2	0.0	68.7	1.5880	0.000	1.582	4.514	-103.042	111	8	5	1497449284
1	Photon	+0	-0.2	0.0	68.7	0.6378	0.000	0.638	9.588	-75.596	22	9	8	1497449284
1	Photon	+0	-0.2	0.0	68.7	0.9501	0.000	0.950	3.473	-161.339	22	10	8	1497449284
1	Photon	+0	-0.2	0.0	68.7	0.4360	0.000	0.436	15.826	42.544	22	11	7	1497449284
1	Photon	+0	-0.2	0.0	68.7	0.5562	0.000	0.556	8.087	-32.494	22	12	7	1497449284
1	Photon	+0	-0.2	0.0	68.7	1.3687	0.000	1.369	2.365	-17.437	22	13	6	1497449284
1	Photon	+0	-0.2	0.0	68.7	0.5502	0.000	0.550	9.782	-79.518	22	14	6	1497449284

$\Phi \rightarrow \pi^+ \pi^- \eta, \pi^0 \pi^0 \eta$ for most Φ decays

wrong!

hd_dump for Φ Events

bggen

Event: 409
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
35	phiMeson	+0	0.0	0.0	0.0	8.6291	0.000	8.567	2.150	-3.161	333	1	0	1
14	Proton	+1	0.0	0.0	0.0	1.0003	0.000	0.347	67.946	176.839	2212	2	0	1

hdgeant

Event: 409
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
35	phiMeson	+0	0.1	0.1	61.5	8.6291	0.000	8.567	2.150	-3.161	333	1	0	1
14	Proton	+1	0.1	0.1	61.5	1.0003	0.000	0.347	67.946	176.839	2212	2	0	1
1	Photon	+0	0.1	0.1	61.5	2.7447	-0.000	2.745	1.143	-31.179	22	3	1	1497449284
33	omega	+0	0.1	0.1	61.5	5.8756	-0.000	5.823	2.699	2.221	223	4	1	1497449284
9	Pi-	-1	0.1	0.1	61.5	1.3517	-0.000	1.344	7.967	61.515	-211	5	4	1497449284
8	Pi+	+1	0.1	0.1	61.5	0.6740	-0.000	0.659	8.511	152.666	211	6	4	1497449284
7	Pi0	+0	0.1	0.1	61.5	3.8503	-0.000	3.848	5.014	-36.068	111	7	4	1497449284
1	Photon	+0	0.1	0.1	61.5	3.5418	-0.000	3.542	4.677	-30.293	22	8	7	1497449284
1	Photon	+0	0.1	0.1	61.5	0.3085	-0.000	0.309	10.628	-66.776	22	9	7	1497449284
5	Muon+	+1	1.2	30.7	455.0	0.1781	0.000	0.143	20.694	-83.198	-13	10	-1	1497449284
4	Neutrino	+0	1.2	30.7	455.0	0.0814	0.000	0.081	21.839	-0.889	121416	11	-1	1497449284
2	Positron	+1	23.9	-35.8	629.5	0.0235	0.000	0.023	59.847	-114.279	-11	12	0	1497449284
4	Neutrino	+0	23.9	-35.8	629.5	0.0323	0.000	0.032	65.744	-175.274	121416	13	0	1497449284
4	Neutrino	+0	23.9	-35.8	629.5	0.0499	0.000	0.050	120.168	29.044	121416	14	0	1497449284

$\Phi \rightarrow \gamma \omega$ for other Φ decays

wrong!

hd_dump for η' Events

Event: 15
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	-0.1	0.1	70.8	5.3156	0.000	5.305	3.489	113.196	-2	1	0	12
0	Unknown	+0	-0.1	0.1	70.8	1.6841	0.000	1.651	11.084	56.837	2	2	0	11
0	Unknown	+0	-0.1	0.1	70.8	2.1149	0.000	2.089	8.890	-66.804	2	3	0	12
0	Unknown	+0	-0.1	0.1	70.8	0.6734	0.000	0.343	112.325	-123.163	2101	4	0	11
0	Unknown	+0	-0.1	0.1	70.8	6.9997	0.000	6.939	4.665	85.272	91	5	1	11
34	EtaPrime	+0	-0.1	0.1	70.8	7.0579	0.000	6.993	4.560	84.909	331	6	5	1
0	Unknown	+0	-0.1	0.1	70.8	2.0589	0.000	2.034	8.890	-66.804	2	7	3	12
0	Unknown	+0	-0.1	0.1	70.8	0.6712	0.000	0.342	112.325	-123.163	2101	8	4	11
0	Unknown	+0	-0.1	0.1	70.8	2.7301	0.000	1.960	16.481	-95.091	91	9	7	11
14	Proton	+1	-0.1	0.1	70.8	1.8087	0.000	1.546	14.765	-64.100	2212	10	9	1
33	omega	+0	-0.1	0.1	70.8	0.9214	0.000	0.486	37.805	-138.017	223	11	9	1
9	Pi-	-1	-0.1	0.1	70.8	0.2390	0.000	0.194	35.609	-44.254	-211	12	11	1497449284
8	Pi+	+1	-0.1	0.1	70.8	0.5029	0.000	0.483	57.434	-172.639	211	13	11	1497449284
7	Pi0	+0	-0.1	0.1	70.8	0.1852	0.000	0.127	105.444	-33.946	111	14	11	1497449284
1	Photon	+0	-0.1	0.1	70.8	0.0409	0.000	0.041	96.811	75.953	22	15	14	1497449284
1	Photon	+0	-0.1	0.1	70.8	0.1443	0.000	0.144	101.565	-49.626	22	16	14	1497449284
6	Muon-	-1	-28.2	-7.6	297.6	0.1414	0.000	0.094	34.332	68.445	13	17	12	1497449284
4	Neutrino	+0	-28.2	-7.6	297.6	0.0804	0.000	0.080	49.226	82.183	121416	18	12	1497449284
3	Electron	-1	-16.9	-103.7	620.6	0.0320	0.000	0.032	61.230	170.246	11	19	17	1497449284
4	Neutrino	+0	-16.9	-103.7	620.6	0.0473	0.000	0.047	128.983	-46.549	121416	20	17	1497449284
4	Neutrino	+0	-16.9	-103.7	620.6	0.0263	0.000	0.026	56.974	83.813	121416	21	17	1497449284
5	Muon+	+1	60.9	-31.3	333.4	0.1392	0.000	0.091	58.088	-9.589	-13	22	-1	1497449284
4	Neutrino	+0	60.9	-31.3	333.4	0.0746	0.000	0.075	43.537	13.518	121416	23	-1	1497449284
12	K-	-1	-0.1	0.1	70.8	3.5557	0.000	3.521	6.604	90.062	-321	24	6	1497449284
11	K+	+1	-0.1	0.1	70.8	3.5109	0.000	3.476	2.587	71.504	321	25	6	1497449284
5	Muon+	+1	1.2	7.4	234.7	2.1174	0.000	2.115	5.926	2.919	-13	26	0	1497449284
4	Neutrino	+0	1.2	7.4	234.7	1.3904	0.000	1.390	10.787	145.655	121416	27	0	1497449284
6	Muon-	-1	65.4	155.9	1827.1	2.9451	0.000	2.943	7.412	77.419	13	28	0	1497449284
4	Neutrino	+0	65.4	155.9	1827.1	0.3488	0.000	0.349	21.007	-68.647	121416	29	0	1497449284

hdgeant

Event: 15
DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	-0.1	0.1	70.8	5.3156	0.000	5.305	3.489	113.196	-2	1	0	0
0	Unknown	+0	-0.1	0.1	70.8	1.6841	0.000	1.651	11.084	56.837	2	2	0	0
0	Unknown	+0	-0.1	0.1	70.8	2.1149	0.000	2.089	8.890	-66.804	2	3	0	0
0	Unknown	+0	-0.1	0.1	70.8	0.6734	0.000	0.343	112.325	-123.163	2101	4	0	0
0	Unknown	+0	-0.1	0.1	70.8	6.9997	0.000	6.939	4.665	85.272	91	5	1	0
34	EtaPrime	+0	-0.1	0.1	70.8	7.0579	0.000	6.993	4.560	84.909	331	6	5	0
0	Unknown	+0	-0.1	0.1	70.8	2.0589	0.000	2.034	8.890	-66.804	2	7	3	0
0	Unknown	+0	-0.1	0.1	70.8	0.6712	0.000	0.342	112.325	-123.163	2101	8	4	0
0	Unknown	+0	-0.1	0.1	70.8	2.7301	0.000	1.960	16.481	-95.091	91	9	7	0
14	Proton	+1	-0.1	0.1	70.8	1.8087	0.000	1.546	14.765	-64.100	2212	10	9	0
33	omega	+0	-0.1	0.1	70.8	0.9214	0.000	0.486	37.805	-138.017	223	11	9	0
9	Pi-	-1	-0.1	0.1	70.8	0.2390	0.000	0.194	35.609	-44.254	-211	12	11	0
8	Pi+	+1	-0.1	0.1	70.8	0.5029	0.000	0.483	57.434	-172.639	211	13	11	0
7	Pi0	+0	-0.1	0.1	70.8	0.1852	0.000	0.127	105.444	-33.946	111	14	11	0
1	Photon	+0	-0.1	0.1	70.8	0.0409	0.000	0.041	96.811	75.953	22	15	14	0
1	Photon	+0	-0.1	0.1	70.8	0.1443	0.000	0.144	101.565	-49.626	22	16	14	0
6	Muon-	-1	-28.2	-7.6	297.6	0.1414	0.000	0.094	34.332	68.445	13	17	12	0
4	Neutrino	+0	-28.2	-7.6	297.6	0.0804	0.000	0.080	49.226	82.183	121416	18	12	0
3	Electron	-1	-16.9	-103.7	620.6	0.0320	0.000	0.032	61.230	170.246	11	19	17	0
4	Neutrino	+0	-16.9	-103.7	620.6	0.0473	0.000	0.047	128.983	-46.549	121416	20	17	0
4	Neutrino	+0	-16.9	-103.7	620.6	0.0263	0.000	0.026	56.974	83.813	121416	21	17	0
5	Muon+	+1	60.9	-31.3	333.4	0.1392	0.000	0.091	58.088	-9.589	-13	22	-1	0
4	Neutrino	+0	60.9	-31.3	333.4	0.0746	0.000	0.075	43.537	13.518	121416	23	-1	0
12	K-	-1	-0.1	0.1	70.8	3.5557	0.000	3.521	6.604	90.062	-321	24	6	0
11	K+	+1	-0.1	0.1	70.8	3.5109	0.000	3.476	2.587	71.504	321	25	6	0
5	Muon+	+1	1.2	7.4	234.7	2.1174	0.000	2.115	5.926	2.919	-13	26	0	0
4	Neutrino	+0	1.2	7.4	234.7	1.3904	0.000	1.390	10.787	145.655	121416	27	0	0
6	Muon-	-1	65.4	155.9	1827.1	2.9451	0.000	2.943	7.412	77.419	13	28	0	0
4	Neutrino	+0	65.4	155.9	1827.1	0.3488	0.000	0.349	21.007	-68.647	121416	29	0	0

REST

generated mech info lost

Treatment of ρ Mesons

Event: 85

DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	0.0	0.0	0.0	5.2948	0.000	5.285	1.994	49.715	2	1	0	12
0	Unknown	+0	0.0	0.0	0.0	0.6427	0.000	0.278	133.024	-87.675	2101	2	0	11
0	Unknown	+0	0.0	0.0	0.0	2.2837	0.000	2.260	4.667	-130.285	-2	3	0	12
0	Unknown	+0	0.0	0.0	0.0	1.2652	0.000	1.221	9.585	92.325	2	4	0	11
0	Unknown	+0	0.0	0.0	0.0	3.5489	0.000	3.459	2.350	153.660	91	5	3	11
34	EtaPrime	+0	0.0	0.0	0.0	4.2101	0.000	4.100	1.893	146.109	331	6	5	1
0	Unknown	+0	0.0	0.0	0.0	4.6480	0.000	4.639	1.994	49.715	2	7	1	12
0	Unknown	+0	0.0	0.0	0.0	0.6282	0.000	0.272	133.024	-87.675	2101	8	2	11
0	Unknown	+0	0.0	0.0	0.0	5.2762	0.000	4.453	1.743	-33.891	92	9	7	11
0	Unknown	+0	0.0	0.0	0.0	4.2083	0.000	4.125	6.567	-1.215	213	10	9	11
13	Neutron	+0	0.0	0.0	0.0	1.0679	0.000	0.508	46.007	-169.664	2112	11	9	1
8	Pi+	+1	0.0	0.0	0.0	1.1413	0.000	1.133	22.427	-37.338	211	12	10	1
7	Pi0	+0	0.0	0.0	0.0	3.0671	0.000	3.064	5.295	63.063	111	13	10	1

bggen

Event: 85

DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	-0.0	0.2	76.6	5.2948	0.000	5.285	1.994	49.715	2	1	0	12
0	Unknown	+0	-0.0	0.2	76.6	0.6427	0.000	0.278	133.024	-87.675	2101	2	0	11
0	Unknown	+0	-0.0	0.2	76.6	2.2837	0.000	2.260	4.667	-130.285	-2	3	0	12
0	Unknown	+0	-0.0	0.2	76.6	1.2652	0.000	1.221	9.585	92.325	2	4	0	11
0	Unknown	+0	-0.0	0.2	76.6	3.5489	0.000	3.459	2.350	153.660	91	5	3	11
34	EtaPrime	+0	-0.0	0.2	76.6	4.2101	0.000	4.100	1.893	146.109	331	6	5	1
0	Unknown	+0	-0.0	0.2	76.6	4.6480	0.000	4.639	1.994	49.715	2	7	1	12
0	Unknown	+0	-0.0	0.2	76.6	0.6282	0.000	0.272	133.024	-87.675	2101	8	2	11
0	Unknown	+0	-0.0	0.2	76.6	5.2762	0.000	4.453	1.743	-33.891	92	9	7	11
0	Unknown	+0	-0.0	0.2	76.6	4.2083	0.000	4.125	6.567	-1.215	213	10	9	11
13	Neutron	+0	-0.0	0.2	76.6	1.0679	0.000	0.508	46.007	-169.664	2112	11	9	1
8	Pi+	+1	-0.0	0.2	76.6	1.1413	0.000	1.133	22.427	-37.338	211	12	10	1
7	Pi0	+0	-0.0	0.2	76.6	3.0671	0.000	3.064	5.295	63.063	111	13	10	1
1	Photon	+0	-0.0	0.2	76.6	0.5558	0.000	0.556	4.063	-5.486	22	14	13	1497449284
1	Photon	+0	-0.0	0.2	76.6	2.5112	0.000	2.511	6.192	70.840	22	15	13	1497449284
12	K-	-1	-0.0	0.2	76.6	2.1735	0.000	2.117	5.238	115.231	-321	16	6	1497449284
11	K+	+1	-0.0	0.2	76.6	2.0526	0.000	1.992	2.984	-106.841	321	17	6	1497449284

hdgeant

Event: 85

DMCThrown:

PID:	Name:	q:	x(cm):	y(cm):	z(cm):	E(GeV):	t(ns):	p(GeV/c):	theta(deg):	phi(deg):	pdgtype:	myid:	parentid:	mech:
0	Unknown	+0	-0.0	0.2	76.6	5.2948	0.000	5.285	1.994	49.715	2	1	0	0
0	Unknown	+0	-0.0	0.2	76.6	0.6427	0.000	0.278	133.024	-87.675	2101	2	0	0
0	Unknown	+0	-0.0	0.2	76.6	2.2837	0.000	2.260	4.667	-130.285	-2	3	0	0
0	Unknown	+0	-0.0	0.2	76.6	1.2652	0.000	1.221	9.585	92.325	2	4	0	0
0	Unknown	+0	-0.0	0.2	76.6	3.5489	0.000	3.459	2.350	153.660	91	5	3	0
34	EtaPrime	+0	-0.0	0.2	76.6	4.2101	0.000	4.100	1.893	146.109	331	6	5	0
0	Unknown	+0	-0.0	0.2	76.6	4.6480	0.000	4.639	1.994	49.715	2	7	1	0
0	Unknown	+0	-0.0	0.2	76.6	0.6282	0.000	0.272	133.024	-87.675	2101	8	2	0
0	Unknown	+0	-0.0	0.2	76.6	5.2762	0.000	4.453	1.743	-33.891	92	9	7	0
43	Rho+	+1	-0.0	0.2	76.6	4.2083	0.000	4.125	6.567	-1.215	213	10	9	0
13	Neutron	+0	-0.0	0.2	76.6	1.0679	0.000	0.508	46.007	-169.664	2112	11	9	0
8	Pi+	+1	-0.0	0.2	76.6	1.1413	0.000	1.133	22.427	-37.338	211	12	10	0
7	Pi0	+0	-0.0	0.2	76.6	3.0671	0.000	3.064	5.295	63.063	111	13	10	0
1	Photon	+0	-0.0	0.2	76.6	0.5558	0.000	0.556	4.063	-5.486	22	14	13	0
1	Photon	+0	-0.0	0.2	76.6	2.5112	0.000	2.511	6.192	70.840	22	15	13	0
12	K-	-1	-0.0	0.2	76.6	2.1735	0.000	2.117	5.238	115.231	-321	16	6	0
11	K+	+1	-0.0	0.2	76.6	2.0526	0.000	1.992	2.984	-106.841	321	17	6	0

All ρ mesons retain their information and this is put back in REST

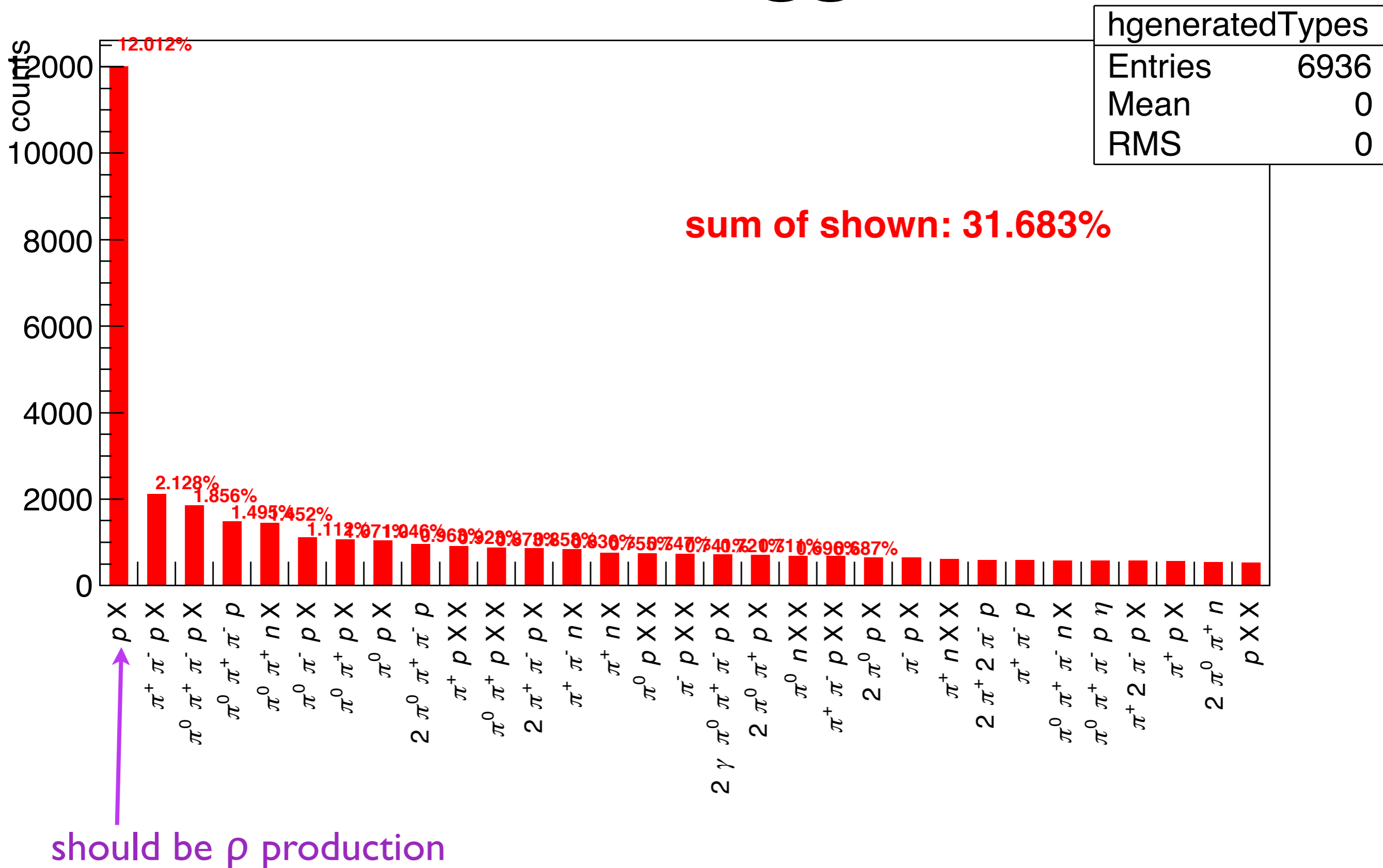
REST

?

Side Note on Ξ

- For 1M events generated, 64 events contain Ξ or Ξ
- 58 events are Ξ , only 6 events contain Ξ
- No Ξ are created as $KK\Xi$, 4 are through $\Xi\Xi$
- pythia does not have mechanism to create $KK\Xi$?

Side Note on bggen Events



Output from genr8 Events

genr8_2_hddm

```
Event: 1
DMCThrown:
PID:   Name:   q:  x(cm):  y(cm):  z(cm):  E(GeV):  t(ns):  p(GeV/c):  theta(deg):  phi(deg):  pdgtype:  myid:  parentid:  mech:
```

PID	Name	q	x(cm)	y(cm)	z(cm)	E(GeV)	t(ns)	p(GeV/c)	theta(deg)	phi(deg)	pdgtype	myid	parentid	mech
11	K+	+1	0.0	0.0	65.0	6.7773	0.000	6.759	9.991	-101.503	321	1	0	0
18	Lambda	+0	0.0	0.0	65.0	2.0603	0.000	1.732	21.626	58.762	3122	2	0	0
17	Eta	+0	0.0	0.0	65.0	1.1005	0.000	0.954	39.813	99.151	221	3	0	0

```
Event: 1
DMCThrown:
PID:   Name:   q:  x(cm):  y(cm):  z(cm):  E(GeV):  t(ns):  p(GeV/c):  theta(deg):  phi(deg):  pdgtype:  myid:  parentid:  mech:
```

PID	Name	q	x(cm)	y(cm)	z(cm)	E(GeV)	t(ns)	p(GeV/c)	theta(deg)	phi(deg)	pdgtype	myid	parentid	mech
11	K+	+1	0.0	0.0	65.0	6.7773	0.000	6.759	9.991	-101.503	321	1	0	0
18	Lambda	+0	0.0	0.0	65.0	2.0603	0.000	1.732	21.626	58.762	3122	2	0	0
17	Eta	+0	0.0	0.0	65.0	1.1005	0.000	0.954	39.813	99.151	221	3	0	0
7	Pi0	+0	-0.0	0.0	65.0	0.2490	0.000	0.209	48.802	152.077	111	4	3	1497449284
7	Pi0	+0	-0.0	0.0	65.0	0.2908	0.000	0.258	43.788	96.874	111	5	3	1497449284
7	Pi0	+0	-0.0	0.0	65.0	0.5604	0.000	0.544	41.191	79.828	111	6	3	1497449284
1	Photon	+0	0.0	0.0	65.0	0.1321	0.000	0.132	16.767	64.291	22	7	6	1497449284
1	Photon	+0	0.0	0.0	65.0	0.4283	0.000	0.428	48.677	81.647	22	8	6	1497449284
1	Photon	+0	-0.0	0.0	65.0	0.2646	0.000	0.265	38.782	93.242	22	9	5	1497449284
1	Photon	+0	-0.0	0.0	65.0	0.0262	0.000	0.026	140.716	136.098	22	10	5	1497449284
1	Photon	+0	-0.0	0.0	65.0	0.2198	0.000	0.220	41.573	153.479	22	11	4	1497449284
1	Photon	+0	-0.0	0.0	65.0	0.0292	0.000	0.029	155.357	135.059	22	12	4	1497449284
13	Neutron	+0	3.3	5.4	81.0	1.6988	0.000	1.415	25.216	54.132	2112	13	2	1497449284
7	Pi0	+0	3.3	5.4	81.0	0.3615	0.000	0.335	10.541	111.260	111	14	2	1497449284
1	Photon	+0	3.3	5.4	81.0	0.0906	0.000	0.091	29.055	-92.630	22	15	14	1497449284
1	Photon	+0	3.3	5.4	81.0	0.2709	0.000	0.271	22.379	101.310	22	16	14	1497449284

hdgeant

Is there a simple way to get generated information?

```
Event: 1
DMCThrown:
PID:   Name:   q:  x(cm):  y(cm):  z(cm):  E(GeV):  t(ns):  p(GeV/c):  theta(deg):  phi(deg):  pdgtype:  myid:  parentid:  mech:
```

PID	Name	q	x(cm)	y(cm)	z(cm)	E(GeV)	t(ns)	p(GeV/c)	theta(deg)	phi(deg)	pdgtype	myid	parentid	mech
11	K+	+1	0.0	0.0	65.0	6.7773	0.000	6.759	9.991	-101.503	321	1	0	0
18	Lambda	+0	0.0	0.0	65.0	2.0603	0.000	1.732	21.626	58.762	3122	2	0	0
17	Eta	+0	0.0	0.0	65.0	1.1005	0.000	0.954	39.813	99.151	221	3	0	0
7	Pi0	+0	-0.0	0.0	65.0	0.2490	0.000	0.209	48.802	152.077	111	4	3	0
7	Pi0	+0	-0.0	0.0	65.0	0.2908	0.000	0.258	43.788	96.874	111	5	3	0
7	Pi0	+0	-0.0	0.0	65.0	0.5604	0.000	0.544	41.191	79.828	111	6	3	0
1	Photon	+0	0.0	0.0	65.0	0.1321	0.000	0.132	16.767	64.291	22	7	6	0
1	Photon	+0	0.0	0.0	65.0	0.4283	0.000	0.428	48.677	81.647	22	8	6	0
1	Photon	+0	-0.0	0.0	65.0	0.2646	0.000	0.265	38.782	93.242	22	9	5	0
1	Photon	+0	-0.0	0.0	65.0	0.0262	0.000	0.026	140.716	136.098	22	10	5	0
1	Photon	+0	-0.0	0.0	65.0	0.2198	0.000	0.220	41.573	153.479	22	11	4	0
1	Photon	+0	-0.0	0.0	65.0	0.0292	0.000	0.029	155.357	135.059	22	12	4	0
13	Neutron	+0	3.3	5.4	81.0	1.6988	0.000	1.415	25.216	54.132	2112	13	2	0
7	Pi0	+0	3.3	5.4	81.0	0.3615	0.000	0.335	10.541	111.260	111	14	2	0
1	Photon	+0	3.3	5.4	81.0	0.0906	0.000	0.091	29.055	-92.630	22	15	14	0
1	Photon	+0	3.3	5.4	81.0	0.2709	0.000	0.271	22.379	101.310	22	16	14	0

REST

Summary

- Something still wrong with PID matching (?) for η' , Φ
- Checked decays for $\omega, \Lambda, \Sigma, \Xi$; look OK
- Treatment of ρ mesons?
- One of the core problems is the intertwining of many particle ID schemes (GlueX, geant, PDG)
- Discussion on which particles decay where?
- Discussion on GEANT4?
- pythia mechanism should be checked regarding strange particle production