Subject: Re: EvtGen Output Fixed Point Precision
Posted by Marius Mertens on Thu, 16 Jul 2009 16:07:54 GMT
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Hi Stefano,

one example I just took from an event file looks like this:

Toggle Spoiler

8 24

N	Id	Ist	M1	M2	DF	DL	px	py	pz	E	t	x	y	z
0	88888	2	-1	-1	1	2	0.0001	-0.0000	9.8081	10.7911	0.0000	0.0000	0.0000	0.0000
1	431	2	0	0	3	4	-0.1031	0.1937	6.0957	6.4094	0.0000	0.0000	-0.0000	0.0000
2	-10431	2	0	0	9	10	0.1032	-0.1937	3.7124	4.3817	0.0000	0.0000	-0.0000	0.0000
3	331	2	1	1	5	6	0.1644	-0.2514	1.6517	1.9331	0.5596	-0.0090	0.0169	0.5322
4	211	1	1	1	-1	-1	-0.2675	0.4451	4.4439	4.4764	0.5596	-0.0090	0.0169	0.5322
5	113	2	3	3	7	8	-0.2246	-0.2185	1.0231	1.1931	0.5596	-0.0090	0.0169	0.5322
6	22	1	3	3	-1	-1	0.3890	-0.0329	0.6286	0.7399	0.5596	-0.0090	0.0169	0.5322
7	211	1	5	5	-1	-1	-0.2382	-0.0779	0.2085	0.3546	0.5596	-0.0090	0.0169	0.5322
8	-211	1	5	5	-1	-1	0.0137	-0.1406	0.8147	0.8385	0.5596	-0.0090	0.0169	0.5322
9	-431	2	2	2	11	12	-0.1946	-0.0838	3.2330	3.7911	0.0000	0.0000	0.0000	0.0000
10	111	2	2	2	22	23	0.2978	-0.1098	0.4794	0.5906	0.0000	0.0000	0.0000	0.0000
11	331	2	9	9	13	15	0.0849	0.2089	0.6670	1.1896	0.1595	-0.0082	-0.0035	0.1361
12	-211	1	9	9	-1	-1	-0.2796	-0.2927	2.5660	2.6015	0.1595	-0.0082	-0.0035	0.1361
13	111	2	11	11	16	17	0.0688	0.1769	0.3666	0.4343	0.1595	-0.0082	-0.0035	0.1361
14	111	2	11	11	18	19	0.0061	0.0425	0.0925	0.1691	0.1595	-0.0082	-0.0035	0.1361
15	221	2	11	11	20	21	0.0101	-0.0104	0.2079	0.5861	0.1595	-0.0082	-0.0035	0.1361
16	22	1	13	13	-1	-1	0.0887	0.1447	0.3570	0.3953	0.1595	-0.0082	-0.0035	0.1361
17	22	1	13	13	-1	-1	-0.0199	0.0322	0.0096	0.0390	0.1595	-0.0082	-0.0035	0.1361
18	22	1	14	14	-1	-1	-0.0405	0.0659	0.0199	0.0798	0.1595	-0.0082	-0.0035	0.1361
19	22	1	14	14	-1	-1	0.0465	-0.0234	0.0726	0.0893	0.1595	-0.0082	-0.0035	0.1361
20	22	1	15	15	-1	-1	-0.2346	-0.0364	-0.0355	0.2400	0.1595	-0.0082	-0.0035	0.1361
21	22	1	15	15	-1	-1	0.2447	0.0259	0.2434	0.3461	0.1595	-0.0082	-0.0035	0.1361
22	22	1	10	10	-1	-1	0.2973	-0.1216	0.4813	0.5786	0.0000	0.0000	0.0000	0.0000
23	22	1	10	10	-1	-1	0.0005	0.0118	-0.0019	0.0120	0.0000	0.0000	0.0000	0.0000

When you calculate the mass of particle 4, it evaluates to 142.266MeV.

The maximum error in mass due to rounding at 4 digits precision is
err_max=0.05MeV*(E+px+py+pz)/sqrt(E^2-px^2-py^2-pz^2)
It is admittedly not very likely that the maximum error is indeed achieved, but it does happen.