

# HepPID

3.01.00

Particle ID Translation Methods

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Aug. 22, 2007

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<https://savannah.cern.ch/projects/heppdt/>

<http://cepa.fnal.gov/psm/HepPID/>

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# 1 HepPID

The Particle Data Group[1] provides a standard numbering scheme[2] for use by Monte Carlo generators. Most generators attempt to use these numbers, but there are occasional differences in implementation. HepPID provides a set of free functions which will translate ID numbers to and from the PDG numbering scheme. These functions are designed to be used by HepPDT, HepMC, or any other class library. The current implementation uses the 2006 numbering scheme.[2]

## 2 Particle Numbering Scheme

The PDG numbering scheme is explained in full detail in reference [2].

Quarks, leptons, gauge bosons, Higgs, and similar particles are assigned numbers between 1 and 80. Numbers 81-100 are for generator specific use. Any particle with an ID of 100 or less is considered a "fundamental" particle. These particles are listed in Appendix A.

The PDG numbering algorithm for composite particles uses a signed 7 digit number for each particle:  $\pm nn_r n_L n_{q_1} n_{q_2} n_{q_3} n_J$ .  $n_{q_{1-3}}$  are quark numbers used to specify the quark content. The rightmost digit,  $n_J = 2J + 1$ , gives the total spin of the composite particle. The scheme does not cover particles of total spin  $J > 4$ . The fifth digit,  $n_L$ , is reserved to distinguish mesons of the same total ( $J$ ) but different spin ( $S$ ) and orbital ( $L$ ) angular momentum quantum numbers. The sixth digit,  $n_r$ , is used to label mesons radially excited above the ground state.

Many states appearing in the PDG meson listing do not yet have definite  $q\bar{q}$  model assignments. For these states,  $n_{q_{2-3}}$  and  $n_J$  are assigned according to the state's most likely flavors and spin. Within these groups  $n_L = 0, 1, 2, \dots$  is used to distinguish states of increasing mass. These states are flagged with  $n = 9$ .

The numbering scheme does not extend to baryons with  $n > 0$ ,  $n_r > 0$ , or  $n_L > 0$ .

Digits  $n_{q_2}$  and  $n_{q_3}$  are used for mesons, with  $n_{q_1} = 0$ . Digits  $n_{q_1}$ ,  $n_{q_2}$ , and  $n_{q_3}$  are used for baryons. Digits  $n_{q_1}$  and  $n_{q_2}$  are used for diquarks, with  $n_{q_3} = 0$ . (A list of diquark states is in Appendix A.) A negative number indicates an antiparticle.

The states are generally listed in order of increasing mass.  $K_L^0$  and  $K_S^0$  are exceptions. Their assigned identification numbers are 130 and 310, respectively.

SUSY particles are indicated with  $n = 1$  for right-handed particles or  $n = 2$  for left-handed particles. Technicolor states have  $n = 3$ . Excited (composite) quarks and leptons are identified by setting  $n = 4$ . Other exotic particles have  $nn_r = 51$ .

The new numbering scheme attempts to list all states needed by the Monte Carlo generators. Appendix B contains a full list of meson states and their ID numbers, up through the top quark states. Appendix C contains a full list of the baryon states.

The baryon  $\Xi$  and  $\Omega$  states for charmed and heavier quarks require special consideration. Three spin 1/2 states are recognized for  $cxy$ ,  $bxy$ , etc., where  $x$  and  $y$  are lighter, non-identical quarks. The non-primed states are antisymmetric under interchange of the lighter quarks. and the primed states are symmetric. The numbering for these states is explicitly stated in the new numbering scheme.

In the past, HepPID used an ad-hoc numbering scheme for ions. The ad-hoc ion numbers were  $1AAAZZZ00n_J$ , where AAA, and ZZZ are the ion's A and Z respectively.

As of PDG 2006[2], nuclear codes are designated by a signed 10 digit number:  $\pm 10LZZZAAAI$ , where AAA is the total baryon number and ZZZ is the total charge. L is the total number of strange quarks in a hypernucleus. I is used to denote excited states. A hydrogen nucleus ( 1000010010 ) should be identified as a proton ( 2212 ) to avoid confusion.

## 2.1 Extending Particle IDs

It is expected that any 7 or 10 digit number used as a particle ID will adhere to the rules of the Monte Carlo Particle Numbering Scheme published by the PDG.[1]

In most cases, users can define particles not already in their particle data table without needing to extend the numbering scheme. A previously unknown particle can be assigned a valid particle ID by following the published rules.[2]

For convenience, a copy ( montecarlopp.pdf ) of the Monte Carlo numbering scheme document is provided with the installed documentation.

## 2.2 Generator Numbering Schemes

The Isajet particle identification algorithm uses a signed four digit number:  $\pm MLKJ$ . M, L, and K are quarks and J is the spin. A negative number indicates the antiparticle, and is meant to associate with the lightest quark. For mesons,  $M = 0$ , and for diquarks,  $K = 0$ .

Pythia, Herwig, EvtGen, and QQ use the PDG algorithm in addition to internal compressed numbering schemes. Although the latest implementations of Pythia, Herwig, and QQ conform closely to the new numbering scheme, some differences remain.

EvtGen numbers particles with a mix of the old and new PDG numbering schemes. In addition, EvtGen defines a number of pseudo-particles which are just conglomerates used by their decay mechanisms. For instance, EvtGen uses the diquark numbers for quark decay pairs. Wherever possible, we retain the EvtGen numbers for these convenience pseudo-particles.

## 2.3 Translating Particle ID's

The header ParticleIDTranslations.hh defines a number of free functions which can be used to translate between generator and standard numbering schemes. Other functions will be added as need arises. Complete code documentation is on the web at <http://lcgapp.cern.ch/project/simu/HepPDT/> or in HepPDT\_reference\_manual.pdf in the installed documentation directory.

QQ needs extra translation methods for the quark pair pseudo-particles since the ID numbers overlap.

```

int   HepPID::translateHerwigtoPDT( const int herwigID);
int   HepPID::translateIsajettoPDT( const int isajetID );
int   HepPID::translatePythiatoPDT( const int pythiaID );
int   HepPID::translateEvtGentoPDT( const int evtGenID );
int   HepPID::translatePDGtabletoPDT( const int pdgID);
int   HepPID::translateQQtoPDT( const int qqID);
int   HepPID::translateQQbar( const int qqID);
int   HepPID::translateGeanttoPDT( const int geantID);

int   HepPID::translatePDTtoHerwig( const int pid );
int   HepPID::translatePDTtoIsajet( const int pid );
int   HepPID::translatePDTtoPythia( const int pid );
int   HepPID::translatePDTtoEvtGen( const int pid );
int   HepPID::translatePDTtoPDGtable( const int pid );
int   HepPID::translatePDTtoQQ( const int pid );
int   HepPID::translateInverseQQbar( const int pid );
int   HepPID::translatePDTtoGeant( const int pid );

void  writeHerwigTranslation( std::ostream & os );
void  writeIsajetTranslation( std::ostream & os );
void  writePythiaTranslation( std::ostream & os );
void  writeEvtGenTranslation( std::ostream & os );
void  writePDGTranslation( std::ostream & os );
void  writeQQTranslation( std::ostream & os );

```

The translation methods use maps which are initialized by the first call to that translation. Because the maps are static, this initialization only happens once. We use a data table so that compile time is not impacted.

You may also get or check the name of a particle. In addition, you may lookup an ID associated with a particle name. This will only work if you use the HepPID names. Use HepPDT to lookup particle ID's using the names of the particles in your ParticleDataTable.

```

std::string  particleName( const int & pid );
int          particleName( const std::string & name );
void         listParticleNames( std::ostream & os );
bool        validParticleName( const int & pid );
bool        validParticleName( const std::string & name );

```

## References

- [1] <http://www-pdg.lbl.gov/>
- [2] Particle Data Group: W.-M. Yao *et al.*, *J. Phys.* **G 33**, 314 (2006), [http://pdg.lbl.gov/2006/mcdata/mc\\_particle\\_id\\_contents.html](http://pdg.lbl.gov/2006/mcdata/mc_particle_id_contents.html)

- [3] Particle Data Group: S. Eidelman *et al.*, *Physics Letters* **B592**, (2004) 292,  
[http://pdg.lbl.gov/2004/mcdata/mc\\_particle\\_id\\_contents.html](http://pdg.lbl.gov/2004/mcdata/mc_particle_id_contents.html)

# A Elementary Particle Identification Code Listing

Numbers which have changed since PDG 2004 are in bold text.

Quarks and Leptons						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$d$	2	1	1	1	1	1
$u$	1	2	2	2	2	2
$s$	3	3	3	3	3	3
$c$	4	4	4	4	4	4
$b$	5	5	5	5	5	5
$t$	6	6	6	6	6	6
$b'$	7 ( $y$ )	7	7 ( $v$ & $h$ )	7	7	7
$t'$	8 ( $x$ )	8	8 ( $a$ & $h'$ )	8	8	8
$e^-$	12	11	11	11	11	11
$\nu_e$	11	12	12	12	12	12
$\mu^-$	14	13	13	13	13	13
$\nu_\mu$	13	14	14	14	14	14
$\tau^-$	16	15	15	15	15	15
$\nu_\tau$	15	16	16	16	16	16
$\tau'^-$		17		17 $L^-$	17	17
$\nu_{\tau'}$		18		18 $\nu_L$	18	18
$\tau_L^-$	10016					<b>93</b>
$\tau_R^-$	20016					<b>94</b>



Gauge and Higgs Bosons						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$g$	9	21	21	21	21 (9)	21 (9)
$\gamma$	10	22	22	22	22	22
$\gamma_{virtual}$				10022		10022
<i>Cerenkov</i>				20022		20022
$Z^0$	90	23	23	23	23	23
$W^+$	80	24	24	24	24	24
$h^0/H_1^0$	81	25	25	25	25	25
$Z'/Z_2^0$		32	32	32	32	32
$Z''/Z_3^0$		33		33	33	33
$W'/W_2^+$		34		34	34	34
$H^0/H_2^0$	83 ( $H_H^0$ )	35	35	35	35	35
$A^0/H_3^0$	84 ( $H_A^0$ )	36	36	36	36	36
$H^+$	86	37	37	37	37	37
$H_1^{++}$	88					52
$H_2^+$	87					53
$H_2^{++}$	89					54
$H_4^0$	85					55
$H_5^0$						
$H_L^{0NOTE}$	82		26			51
Special Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$G$ (graviton)	92	39	39		39	39
$R^0$		41		40	41	41
$LQ^c$		42			42	42
<i>reggeon</i>		110		28	110	110
<i>pomeron</i>		990		29	990	990
<i>odderon</i>					9990	9990
internal code		81-99	81-91	81-99	81-100	81-100
NOTE: $H_L^0$ is redundant with $h^0/H_1^0$ , but is given a different number in Isajet and Herwig.						

Supersymmetric Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\tilde{d}_L$	22	1000001	1000001		1000001	1000001
$\tilde{u}_L$	21	1000002	1000002		1000002	1000002
$\tilde{s}_L$	23	1000003	1000003		1000003	1000003
$\tilde{c}_L$	24	1000004	1000004		1000004	1000004
$\tilde{b}_1/\tilde{b}_L$	25	1000005	1000005		1000005	1000005
$\tilde{t}_1/\tilde{t}_L$	26	1000006	1000006		1000006	1000006
$\tilde{e}_L^-$	32	1000011	1000011		1000011	1000011
$\tilde{\nu}_{eL}$	31	1000012	1000012		1000012	1000012
$\tilde{\mu}_L^-$	34	1000013	1000013		1000013	1000013
$\tilde{\nu}_{\mu L}$	33	1000014	1000014		1000014	1000014
$\tilde{\tau}_1^-/\tilde{\tau}_L^-$	36	1000015	1000015		1000015	1000015
$\tilde{\nu}_{\tau L}$	35	1000016	1000016		1000016	1000016
$\tilde{d}_R$	42	2000001	2000001		2000001	2000001
$\tilde{u}_R$	41	2000002	2000002		2000002	2000002
$\tilde{s}_R$	43	2000003	2000003		2000003	2000003
$\tilde{c}_R$	44	2000004	2000004		2000004	2000004
$\tilde{b}_2/\tilde{b}_R$	45	2000005	2000005		2000005	2000005
$\tilde{t}_2/\tilde{t}_R$	46	2000006	2000006		2000006	2000006
$\tilde{e}_R^-$	52	2000011	2000011		2000011	2000011
$\tilde{\nu}_{eR}$	51	2000012	2000012			2000012
$\tilde{\mu}_R^-$	54	2000013	2000013		2000013	2000013
$\tilde{\nu}_{\mu R}$	53	2000014	2000014			2000014
$\tilde{\tau}_2^-/\tilde{\tau}_R^-$	56	2000015	2000015		2000015	2000015
$\tilde{\nu}_{\tau R}$	55	2000016	2000016			2000016

Supersymmetric Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\tilde{g}$	29	1000021	1000021		1000021	1000021
$\tilde{\chi}_1^0/\tilde{\gamma}$	30 ( $Z_1^{ss}$ )	1000022	1000022		1000022	1000022
$\tilde{\chi}_2^0/\tilde{Z}^0$	40 ( $Z_2^{ss}$ )	1000023	1000023		1000023	1000023
$\tilde{\chi}_1^+/\tilde{W}^+$	39 ( $W_1^{+ss}$ )	1000024	1000024		1000024	1000024
$\tilde{\chi}_3^0/\tilde{H}_1^0$	50 ( $Z_3^{ss}$ )	1000025	1000025		1000025	1000025
$\tilde{\chi}_4^0/\tilde{H}_2^0$	60 ( $Z_4^{ss}$ )	1000035	1000035		1000035	1000035
$\tilde{\chi}_2^+/\tilde{H}^+$	49 ( $W_2^{+ss}$ )	1000037	1000037		1000037	1000037
$\tilde{G}$	91	1000039	1000039		1000039	1000039

  

Technicolor Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\pi_{tech}^0$		3000111			3000111	3000111
$\pi_{tech}^+$		3000211			3000211	3000211
$\pi_{tech}^{0\ NOTE}$		3000221			3000221	3000221
$\eta_{tech}^{0\ NOTE}$		3000331			3100221	3100221
$\rho_{tech}^0$		3000113			3000113	3000113
$\rho_{tech}^+$		3000213			3000213	3000213
$\omega_{tech}^0$		3000223			3000223	3000223
$V_8$		3100021			3100021	3100021
$\pi_{tech22}^1$		3100111			3060111	3060111
$\pi_{tech22}^8$		3200111			3160111	3160111
$\rho_{tech11}$		3100113			3130113	3130113
$\rho_{tech12}$		3200113			3140113	3140113
$\rho_{tech21}$		3300113			3150113	3150113
$\rho_{tech22}$		3400113			3160113	3160113

NOTE: Newer technicolor models use  $\pi_{tech}^{0\prime}$  instead of  $\eta_{tech}^0$ .

Excited Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$d^*$		4000001			4000001	4000001
$u^*$		4000002			4000002	4000002
$e^*$		4000011			4000011	4000011
$\nu_e^*$		4000012			4000012	4000012
$G^*$		5000039				4000039

R-hadrons						
R-hadron	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$R_{\tilde{g}g}^0$					1000993	1000993
$R_{\tilde{g}d\bar{d}}^0$					1009113	1009113
$R_{\tilde{g}u\bar{d}}^+$					1009213	1009213
$R_{\tilde{g}u\bar{u}}^0$					1009223	1009223
$R_{\tilde{g}d\bar{s}}^0$					1009313	1009313
$R_{\tilde{g}u\bar{s}}^+$					1009323	1009323
$R_{\tilde{g}s\bar{s}}^0$					1009333	1009333
$R_{\tilde{g}ddd}^-$					1091114	1091114
$R_{\tilde{g}udd}^0$					1092114	1092114
$R_{\tilde{g}uud}^+$					1092214	1092214
$R_{\tilde{g}uuu}^{++}$					1092224	1092224
$R_{\tilde{g}sdd}^-$					1093114	1093114
$R_{\tilde{g}sud}^0$					1093214	1093214
$R_{\tilde{g}suu}^+$					1093224	1093224
$R_{\tilde{g}ssd}^-$					1093314	1093314
$R_{\tilde{g}ssu}^0$					1093324	1093324
$R_{\tilde{g}sss}^-$					1093334	1093334
$R_{\tilde{t}_1\bar{d}}^+$					1000612	1000612
$R_{\tilde{t}_1\bar{u}}^0$					1000622	1000622
$R_{\tilde{t}_1\bar{s}}^+$					1000632	1000632
$R_{\tilde{t}_1\bar{c}}^0$					1000642	1000642
$R_{\tilde{t}_1\bar{b}}^+$					1000652	1000652
$R_{\tilde{t}_1 dd_1}^0$					1006113	1006113
$R_{\tilde{t}_1 ud_0}^+$					1006211	1006211
$R_{\tilde{t}_1 ud_1}^+$					1006213	1006213
$R_{\tilde{t}_1 uu_1}^{++}$					1006223	1006223
$R_{\tilde{t}_1 sd_0}^0$					1006311	1006311
$R_{\tilde{t}_1 sd_1}^0$					1006313	1006313
$R_{\tilde{t}_1 su_0}^+$					1006321	1006321
$R_{\tilde{t}_1 su_1}^+$					1006323	1006323
$R_{\tilde{t}_1 ss_1}^0$					1006333	1006333

Diquarks						
Diquark	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$(dd)_0^{NOTE}$				1101		1101
$(ud)_0$	1200	2101	2101	2101	2101	2101
$(uu)_0^{NOTE}$				2201		2201
$(sd)_0$	2300	3101	3101	3101	3101	3101
$(su)_0$	1300	3201	3201	3201	3201	3201
$(ss)_0^{NOTE}$				3301		3301
$(cd)_0$	-2400	4101		4101	4101	4101
$(cu)_0$	-1400	4201		4201	4201	4201
$(cs)_0$	-3400	4301		4301	4301	4301
$(cc)_0^{NOTE}$				4401		4401
$(bd)_0$	2500	5101		5101	5101	5101
$(bu)_0$	1500	5201		5201	5201	5201
$(bs)_0$	3500	5301		5301	5301	5301
$(bc)_0$	4500	5401		5401	5401	5401
$(bb)_0^{NOTE}$				5501		5501
$(dd)_1$	2200	1103	1103	1103	1103	1103
$(ud)_1$		2103		2103	2103	2103
$(uu)_1$	1100	2203	2203	2203	2203	2203
$(sd)_1$		3103		3103	3103	3103
$(su)_1$		3203		3203	3203	3203
$(ss)_1$	3300	3303	3303	3303	3303	3303
$(cd)_1$		4103		4103	4103	4103
$(cu)_1$		4203		4203	4203	4203
$(cs)_1$		4303		4303	4303	4303
$(cc)_1$	4400	4403		4403	4403	4403
$(bd)_1$		5103		5103	5103	5103
$(bu)_1$		5203		5203	5203	5203
$(bs)_1$		5303		5303	5303	5303
$(bc)_1$		5403		5403	5403	5403
$(bb)_1$	5500	5503		5503	5503	5503

NOTE: EvtGen uses the diquark numbers for quark pair pseudo-particles.

Other Exotics						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\nu_{Re}$		9900012				9900012
$\nu_{R\mu}$		9900014				9900014
$\nu_{R\tau}$		9900016				9900016
$Z_R^0$		9900023				9900023
$W_R^+$		9900024				9900024
$H_L^{++}$		9900041				9900061
$H_R^{++}$		9900042				9900062
Pentaquarks						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Theta^+$						9221132
$\Phi^{--}$						9331122

Miscellaneous Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\rho_{diff}^0$		9900110		110		9910113
$\pi_{diff}^+$		9900210		210		9910211
$\omega_{diff}^0$		9900220		220		9910223
$\phi_{diff}^0$		9900330		330		9910333
$J/\psi_{diff}^0$		9900440		440		9910443
$n_{diff}^0$		9902110		2110		9912112
$p_{diff}^+$		9902210		2210		9912212
$c\bar{c}[3S18]$		<b>9900443</b>				<b>9900443</b>
$c\bar{c}[1S08]$		<b>9900441</b>				<b>9900441</b>
$c\bar{c}[3P08]$		<b>9910441</b>				<b>9910441</b>
$b\bar{b}[3S18]$		<b>9900553</b>				<b>9900553</b>
$b\bar{b}[1S08]$		<b>9900551</b>				<b>9900551</b>
$b\bar{b}[3P08]$		<b>9910551</b>				<b>9910551</b>
remnant photon			98			9920022
remnant nucleon			99			9922212
Hydrogen <sup>NOTE</sup>						<b>1000010010</b>
Deuterium				1011		<b>1000010020</b>
Tritium				1021		<b>1000010030</b>
$He^3$				1012		<b>1000020030</b>
$\alpha$				1022		<b>1000020040</b>
geantino				100		101
charged geantino				101		102
NOTE: To avoid confusion, it is better to use the proton code for Hydrogen.						

## B Complete Meson Particle Identification Code Listing

Numbers which have changed since PDG 2004 are in bold text.



Light Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\pi^0$	110	111	111	111	111	111
$\pi^+$	120	211	211	211	211	211
$a_0^0(980)$		10111	9000111	10111	9000111	9000111
$a_0^+(980)$		10211	9000211	10211	9000211	9000211
$\pi^0(1300)$				20111	100111	100111
$\pi^+(1300)$				20211	100211	100211
$a_0^0(1450)$			10111		10111	10111
$a_0^+(1450)$			10211		10211	10211
$\pi^0(1800)$					9010111	9010111
$\pi^+(1800)$					9010211	9010211
$\rho^0(770)$	111	113	113	113	113	113
$\rho^+(770)$	121	213	213	213	213	213
$b_1^0(1235)$		10113	10113	10113	10113	10113
$b_1^+(1235)$		10213	10213	10213	10213	10213
$a_1^0(1260)$	10111	20113	20113	20113	20113	20113
$a_1^+(1260)$	10121	20213	20213	20213	20213	20213
$\pi_1^0(1400)$					9000113	9000113
$\pi_1^+(1400)$					9000213	9000213
$\rho^0(1450)$				30113	100113	100113
$\rho^+(1450)$				30213	100213	100213
$\pi_1^0(1600)$					9010113	9010113
$\pi_1^+(1600)$					9010213	9010213
$a_1^0(1640)$					<b>9020113</b>	<b>9020113</b>
$a_1^+(1640)$					<b>9020213</b>	<b>9020213</b>
$\rho^0(1700)/\rho^0(D)$			30113	40113	30113	30113
$\rho^+(1700)/\rho^+(D)$			30213	40213	30213	30213
$\rho^0(1900)$					<b>9030113</b>	<b>9030113</b>
$\rho^+(1900)$					<b>9030213</b>	<b>9030213</b>
$\rho^0(2150)$					<b>9040113</b>	<b>9040113</b>
$\rho^+(2150)$					<b>9040213</b>	<b>9040213</b>

Light Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$a_2^0(1320)$		115	115	115	115	115
$a_2^+(1320)$		215	215	215	215	215
$\pi_2^0(1670)$			10115		10115	10115
$\pi_2^+(1670)$			10215		10215	10215
$a_2^0(1700)$					<b>9000115</b>	<b>9000115</b>
$a_2^+(1700)$					<b>9000215</b>	<b>9000215</b>
$\pi_2^0(2100)$					<b>9010115</b>	<b>9010115</b>
$\pi_2^+(2100)$					<b>9010215</b>	<b>9010215</b>
$\rho_3^0(1690)$			117		117	117
$\rho_3^+(1690)$			217		217	217
$\rho_3^0(1990)$					9000117	9000117
$\rho_3^+(1990)$					9000217	9000217
$\rho_3^0(2250)$					9010117	9010117
$\rho_3^+(2250)$					9010217	9010217
$a_4^0(2040)$					119	119
$a_4^+(2040)$					219	219

<i>uū, dđ, and sš</i> Meson admixtures						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\eta$	220	221	221	221	221	221
$\eta'(958)$	330	331	331	331	331	331
$f_0(600)$					9000221	9000221
$f_0(980)$	10110	10221	9010221 $f'_0$	10221	9010221	9010221
$\eta(1295)$					100221	100221
$f_0(1370)/f'_0$		10331	10221 $f_0^0(H)$	10331	10221	10221
$\eta(1405)$					9020221	9020221
$\eta(1475)$					100331	100331
$f_0(1500)$				50221	9030221	9030221
$f_0(1710)$					10331	10331
$\eta(1760)$					<b>9040221</b>	<b>9040221</b>
$f_0(2020)$					<b>9050221</b>	<b>9050221</b>
$f_0(2100)$					<b>9060221</b>	<b>9060221</b>
$f_0(2200)$					<b>9070221</b>	<b>9070221</b>
$\eta(2225)$					<b>9080221</b>	<b>9080221</b>
$\omega(782)$	221	223	223	223	223	223
$\phi(1020)$	331	333	333	333	333	333
$h_1(1170)$		10223	10223	10223	10223	10223
$f_1(1285)$		20223	20223	20223	20223	20223
$h_1(1380)/h'_1$		10333	10333	10333	10333	10333
$f_1(1420)/f'_1$		20333	20333 $f_1(H)$	20333	20333	20333
$\omega(1420)$				30223	100223	100223
$f_1(1510)$					9000223	9000223
$h_1(1595)$					<b>9010223</b>	<b>9010223</b>
$\omega(1650)$			30223		30223	30223
$\phi(1680)$					100333	100333

$u\bar{u}$ , $d\bar{d}$ , and $s\bar{s}$ Meson admixtures						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$f_2(1270)$	112	225	225	225	225	225
$f_2(1430)$					9000225	9000225
$f_2'(1525)$		335	335	335	335	335
$f_2(1565)$					9010225	9010225
$f_2(1640)$					9020225	9020225
$\eta_2(1645)$			10225		10225	10225
$f_2(1810)$					9030225	9030225
$\eta_2(1870)$			10335		10335	10335
$f_2(1910)$					9040225	9040225
$f_2(1950)$					9050225	9050225
$f_2(2010)$					9060225	9060225
$f_2(2150)$					9070225	9070225
$f_2(2300)$					9080225	9080225
$f_2(2340)$					9090225	9090225
$\omega_3(1670)$			227		227	227
$\phi_3(1850)$			337		337	337
$f_4(2050)$					229	229
$f_J(2220)$					9000229	9000229
$f_4(2300)$					9010229	9010229

Strange Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$K_S^0$	20	310	310	310	310	310
$K_L^0$	-20	130	130	130	130	130
$K^0$	230	311	311	311	311	311
$K^+$	130	321	321	321	321	321
$K_0^{*0}(800)$					9000311	9000311
$K_0^{*+}(800)$					9000321	9000321
$K_0^{*0}(1430)$		10311	10311	10311	10311	10311
$K_0^{*+}(1430)$		10321	10321	10321	10321	10321
$K^0(1460)$					100311	100311
$K^+(1460)$					100321	100321
$K^0(1830)$					<b>9010311</b>	<b>9010311</b>
$K^+(1830)$					<b>9010321</b>	<b>9010321</b>
$K_0^{*0}(1950)$					<b>9020311</b>	<b>9020311</b>
$K_0^{*+}(1950)$					<b>9020321</b>	<b>9020321</b>
$K^{*0}(892)$	231	313	313	313	313	313
$K^{*+}(892)$	131	323	323	323	323	323
$K_1^0(1270)$	10231	10313	10313 ( $K_1^0(L)$ )	10313	10313	10313
$K_1^+(1270)$	10131	10323	10323 ( $K_1^+(L)$ )	10323	10323	10323
$K_1^0(1400)$		20313 ( $K_1^{*0}$ )	20313 ( $K_1^0(H)$ )	20313	20313	20313
$K_1^+(1400)$		20323 ( $K_1^{*+}$ )	20323 ( $K_1^+(H)$ )	20323	20323	20323
$K^{*0}(1410)$	30231			100313	100313	100313
$K^{*+}(1410)$	30131			100323	100323	100323
$K_1^0(1650)$					<b>9000313</b>	<b>9000313</b>
$K_1^+(1650)$					<b>9000323</b>	<b>9000323</b>
$K^{*0}(1680)$			30313	30313	30313	30313
$K^{*+}(1680)$			30323	30323	30323	30323

Strange Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$K_2^{*0}(1430)$	232	315	315	315	315	315
$K_2^{*+}(1430)$	132	325	325	325	325	325
$K_2^0(1580)$					9000315	9000315
$K_2^+(1580)$					9000325	9000325
$K_2^0(1770)$			10315		10315	10315
$K_2^+(1770)$			10325		10325	10325
$K_2^0(1820)$			20315		20315	20315
$K_2^+(1820)$			20325		20325	20325
$K_2^{*0}(1980)$					<b>9010315</b>	<b>9010315</b>
$K_2^{*+}(1980)$					<b>9010325</b>	<b>9010325</b>
$K_2^0(2250)$					<b>9020315</b>	<b>9020315</b>
$K_2^+(2250)$					<b>9020325</b>	<b>9020325</b>
$K_3^{*0}(1780)$			317	317	317	317
$K_3^{*+}(1780)$			327	327	327	327
$K_3^0(2320)$					9010317	9010317
$K_3^+(2320)$					9010327	9010327
$K_4^{*0}(2045)$				319	319	319
$K_4^{*+}(2045)$				329	329	329
$K_4^0(2500)$					9000319	9000319
$K_4^+(2500)$					9000329	9000329

Charmed Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$D^+$	-240	411	411	411	411	411
$D^0$	-140	421	421	421	421	421
$D_0^{*+}(2400)$		10411	10411	10411	10411	10411
$D_0^{*0}(2400)$		10421	10421	10421	10421	10421
$D(2S)^+$				30411		100411
$D(2S)^0$				30421		100421
$D^{*+}(2010)$	-241	413	413	413	413	413
$D^{*0}(2007)$	-141	423	423	423	423	423
$D_1^+(2420)/D_1^+(L)$		10413	10413	10413	10413	10413
$D_1^0(2420)/D_1^0(L)$		10423	10423	10423	10423	10423
$D_1^+(H)/D_1^{*+}$		20413	20413	20413	20413	20413
$D_1^0(2430)$		20423	20423	20423	20423	20423
$D(2S)^{*+}$				30413		100413
$D(2S)^{*0}$				30423		100423
$D_2^{*+}(2460)$		415	415	415	415	415
$D_2^{*0}(2460)$		425	425	425	425	425
$D_s^+$	-340 ( $F^+$ )	431	431	431	431	431
$D_{s0}^{*+}$		10431	10431	10431	10431	10431
$D_s^{*+}$	-341 ( $F^{*+}$ )	433	433	433	433	433
$D_{s1}^+(2536)/D_{s1}^+(L)$		10433	10433	10433	10433	10433
$D_{s1}^+(H)/D_{s1}^{*+}$		20433	20433	20433	20433	20433
$D_{s2}^{*+}$		435	435	435	435	435

$c\bar{c}$ Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\eta_c(1S)$	440	441	441	441	441	441
$\chi_{c0}(1P)$	20440	10441	10441 ( $\chi_{c1}$ )	10441	10441	10441
$\eta_c(2S)$				20441	100441	100441
$J/\psi(1S)$	441	443	443	443	443	443
$h_c(1P)$		10443	10443	10443	10443	10443
$\chi_{c1}(1P)$	20441	20443	20443 ( $\chi_{c0}$ )	20443	20443	20443
$\psi(2S)/\psi'$	10441	100443	100443	30443	100443	100443
$\psi(3770)$			30443	40443	30443	30443
$\psi(4040)$				50443	9000443	9000443
$\psi(4160)$				60443	9010443	9010443
$\psi(4415)$				70443	9020443	9020443
$\chi_{c2}(1P)$	20442	445	445	445	445	445
$\chi_{c2}(2P)$					<b>100445</b>	<b>100445</b>



Bottom Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$B^0(L)$				150		150
$B^0(H)$				510		510
$B^0$	250	511	511	511	511	511
$B^+$	150	521	521	521	521	521
$B_0^{*0}$		10511	10511	10511	10511	10511
$B_0^{*+}$		10521	10521	10521	10521	10521
$B^{*0}$	251	513	513	513	513	513
$B^{*+}$	151	523	523	523	523	523
$B_1^0(L)$		10513	10513	10513	10513	10513
$B_1^+(L)$		10523	10523	10523	10523	10523
$B_1^0(H)/B_1^{*0}$		20513	20513	20513	20513	20513
$B_1^+(H)/B_1^{*+}$		20523	20523	20523	20523	20523
$B_2^{*0}$		515	515	515	515	515
$B_2^{*+}$		525	525	525	525	525
$B_s^0(L)$				350		350
$B_s^0(H)$				530		530
$B_s^0$	350	531	531	531	531	531
$B_{s0}^{*0}$		10531	10531	10531	10531	10531
$B_s^{*0}$	351	533	533	533	533	533
$B_{s1}^0(L)$		10533	10533	10533	10533	10533
$B_{s1}^0(H)/B_{s1}^{*0}$		20533	20533	20533	20533	20533
$B_{s2}^{*0}$		535	535	535	535	535
$B_c^+$	450	541	541	541	541	541
$B_{c0}^{*+}$		10541	10541	10541	10541	10541
$B_c^{*+}$	451	543	543	543	543	543
$B_{c1}^+(L)$		10543	10543	10543	10543	10543
$B_{c1}^+(H)/B_{c1}^{*+}$		20543	20543	20543	20543	20543
$B_{c2}^{*+}$		545	545	545	545	545

$b\bar{b}$ Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\eta_b(1S)$	550	551	551	551	551	551
$\chi_{b0}(1P)$		10551	10551	10551	10551	10551
$\eta_b(2S)$				20551	100551	100551
$\chi_{b0}(2P)$			110551	30551	110551	110551
$\eta_b(3S)$				40551	200551	200551
$\chi_{b0}(3P)$				50551	210551	210551
$\Upsilon(1S)$	551	553	553	553	553	553
$h_b(1P)$		10553	10553	10553	10553	10553
$\chi_{b1}(1P)$		20553	20553	20553	20553	20553
$\Upsilon_1(1D)$				120553	30553	30553
$\Upsilon(2S)/\Upsilon'$		100553	100553	30553	100553	100553
$h_b(2P)$					110553	110553
$\chi_{b1}(2P)$			120553	50553	120553	120553
$\Upsilon_1(2D)$				130553	130553	130553
$\Upsilon(3S)$			200553	60553	200553	200553
$h_b(3P)$					210553	210553
$\chi_{b1}(3P)$				110553	220553	220553
$\Upsilon(4S)$			300553	70553	300553	300553
$\Upsilon(10860)$				80553	9000553	9000553
$\Upsilon(11020)$					9010553	9010553
$\Upsilon(7S)$						9020553
$\chi_{b2}(1P)$		555	555	555	555	555
$\eta_{b2}(1D)$				40555	10555	10555
$\Upsilon_2(1D)$				30555	20555	20555
$\chi_{b2}(2P)$			100555	10555	100555	100555
$\eta_{b2}(2D)$				60555	110555	110555
$\Upsilon_2(2D)$				50555	120555	120555
$\chi_{b2}(3P)$				20555	200555	200555
$\Upsilon_3(1D)$				557	557	557
$\Upsilon_3(2D)$				10557	100557	100557

Top Mesons						
Meson	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$T^+$	-260		611			611
$T^0$	-160		621			621
$T^{*+}$	-261					613
$T^{*0}$	-161					623
$T_s^+$	-360		631			631
$T_s^{*+}$	-361					633
$T_c^0$	460		641			641
$T_c^{*0}$	461					643
$T_b^+$	-560		651			651
$T_b^{*+}$	-561					653
$\eta_t$	660					661
$\theta$	661		663			663
Miscellaneous EvtGen Particles						
Particle	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$Xu^0$				41		42
$Xu^+$				42		43
$\sigma^0$				10222		10222
$Xsd$				30343		30343
$Xsu$				30353		30353
$Xdd$				30373		30373
$Xdu$				30383		30383
$Xss$				30363		30363
$dummy00_1$				51		51
$dummy10_1$				52		52
$dummy01_1$				53		53
$dummy11_1$				54		54
$dummy00_2$				55		55
$dummy10_2$				56		56
$dummy01_2$				57		57
$dummy11_2$				58		58

## C Baryon Particle Identification Code Listing

Light Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$p$	1120	2212	2212	2212	2212	2212
$n$	1220	2112	2112	2112	2112	2112
$N(1440)^+$					12212	<b>12212</b>
$N(1440)^0$					12112	<b>12112</b>
$N(1520)^+$					2124	<b>2124</b>
$N(1520)^0$					1214	<b>1214</b>
$N(1535)^+$					22212	<b>22212</b>
$N(1535)^0$					22112	<b>22112</b>
$N(1650)^+$					32212	<b>32212</b>
$N(1650)^0$					32112	<b>32112</b>
$N(1675)^+$					2216	<b>2216</b>
$N(1675)^0$					2116	<b>2116</b>
$N(1680)^+$					12216	<b>12216</b>
$N(1680)^0$					12116	<b>12116</b>
$N(1700)^+$					22124	<b>22124</b>
$N(1700)^0$					21214	<b>21214</b>
$N(1710)^+$					42212	<b>42212</b>
$N(1710)^0$					42112	<b>42112</b>
$N(1720)^+$					32124	<b>32124</b>
$N(1720)^0$					31214	<b>31214</b>
$N(2190)^+$					2128	<b>2128</b>
$N(2190)^0$					1218	<b>1218</b>

Light Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Delta^{++}$	1111	2224	2224	2224	2224	2224
$\Delta^+$	1121	2214	2214	2214	2214	2214
$\Delta^0$	1221	2114	2114	2114	2114	2114
$\Delta^-$	2221	1114	1114	1114	1114	1114
$\Delta(1600)^{++}$					32224	<b>32224</b>
$\Delta(1600)^+$					32214	<b>32214</b>
$\Delta(1600)^0$					32114	<b>32114</b>
$\Delta(1600)^-$					31114	<b>31114</b>
$\Delta(1620)^{++}$					2222	<b>2222</b>
$\Delta(1620)^+$					1212	<b>1212</b>
$\Delta(1620)^0$					2112	<b>2112</b>
$\Delta(1620)^-$					1112	<b>1112</b>
$\Delta(1700)^{++}$					12224	<b>12224</b>
$\Delta(1700)^+$					12214	<b>12214</b>
$\Delta(1700)^0$					12114	<b>12114</b>
$\Delta(1700)^-$					11114	<b>11114</b>
$\Delta(1905)^{++}$					2226	<b>2226</b>
$\Delta(1905)^+$					2126	<b>2126</b>
$\Delta(1905)^0$					1216	<b>1216</b>
$\Delta(1905)^-$					1116	<b>1116</b>
$\Delta(1910)^{++}$					22222	<b>22222</b>
$\Delta(1910)^+$					21212	<b>21212</b>
$\Delta(1910)^0$					22112	<b>22112</b>
$\Delta(1910)^-$					21112	<b>21112</b>
$\Delta(1950)^{++}$					2228	<b>2228</b>
$\Delta(1950)^+$					2218	<b>2218</b>
$\Delta(1950)^0$					1218	<b>2118</b>
$\Delta(1950)^-$					1118	<b>1118</b>

Strange Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Lambda$	2130	3122	3122	3122	3122	3122
$\Lambda(1404)$				13122	13122	<b>13122</b>
$\Lambda(1520)$				3124	3124	<b>3124</b>
$\Lambda(1600)$				23122	23122	<b>23122</b>
$\Lambda(1670)$				33122	33122	<b>33122</b>
$\Lambda(1690)$				13124	13124	<b>13124</b>
$\Lambda(1800)$				43122	43122	<b>43122</b>
$\Lambda(1810)$				53122	53122	<b>53122</b>
$\Lambda(1820)$				3126	3126	<b>3126</b>
$\Lambda(1830)$				13126	13126	<b>13126</b>
$\Lambda(1890)$					23124	<b>23124</b>
$\Lambda(2100)$					3128	<b>3128</b>
$\Lambda(2110)$					23126	<b>23126</b>

Strange Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Sigma^+$	1130	3222	3222	3222	3222	3222
$\Sigma^0$	1230	3212	3212	3212	3212	3212
$\Sigma^-$	2230	3112	3112		3112	3112
$\Sigma(1660)^+$					13222	<b>13222</b>
$\Sigma(1660)^0$				13212	13212	<b>13212</b>
$\Sigma(1660)^-$					13112	<b>13112</b>
$\Sigma(1750)^+$					23222	<b>23222</b>
$\Sigma(1750)^0$				23212	23212	<b>23212</b>
$\Sigma(1750)^-$					23112	<b>23112</b>
$\Sigma^{*+}/\Sigma(1385)^+$	1131	3224	3224	3224	3224	3224
$\Sigma^{*0}/\Sigma(1385)^0$	1231	3214	3214	3214	3214	3214
$\Sigma^{*-}/\Sigma(1385)^-$	2231	3114	3114		3114	3114
$\Sigma(1670)^+$					13224	<b>13224</b>
$\Sigma(1670)^0$				13214	13214	<b>13214</b>
$\Sigma(1670)^-$					13114	<b>13114</b>
$\Sigma(1940)^+$					23224	<b>23224</b>
$\Sigma(1940)^0$					23214	<b>23214</b>
$\Sigma(1940)^-$					23114	<b>23114</b>
$\Sigma(1775)^+$					3226	<b>3226</b>
$\Sigma(1775)^0$				3216	3216	<b>3216</b>
$\Sigma(1775)^-$					3116	<b>3116</b>
$\Sigma(1915)^+$					13226	<b>13226</b>
$\Sigma(1915)^0$					13216	<b>13216</b>
$\Sigma(1915)^-$					13116	<b>13116</b>
$\Xi^0$	1330	3322	3322		3322	3322
$\Xi^-$	2330	3312	3312		3312	3312
$\Xi^{*0}/\Xi(1530)^0$	1331	3324	3324		3324	3324
$\Xi^{*-}/\Xi(1530)^-$	2331	3314	3314		3314	3314
$\Omega^-$	3331	3334	3334	3334	3334	3334

Charmed Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Lambda_c^+$	2140	4122	4122	4122	4122	4122
$\Lambda_c(2593)$				14122	14122	<b>14122</b>
$\Lambda_c(2625)$				14124		<b>14124</b>
$\Sigma_c^{++}$	1140	4222	4222	4222	4222	4222
$\Sigma_c^+$	1240	4212	4212	4212	4212	4212
$\Sigma_c^0$	2240	4112	4112	4112	4112	4112
$\Sigma_c^{*++}$	1141	4224	4224	4224	4224	4224
$\Sigma_c^{*+}$	1241	4214	4214	4214	4214	4214
$\Sigma_c^{*0}$	2241	4114	4114	4114	4114	4114
$\Xi_c^+$	3140	4232	4232	4232	4232	4232
$\Xi_c^0$	3240	4132	4132	4132	4132	4132
$\Xi_c'^+$	1340	4322	4322	4322	4322	4322
$\Xi_c'^0$	2340	4312	4312	4312	4312	4312
$\Xi_c^{*+}$	1341	4324	4324	4324	4324	4324
$\Xi_c^{*0}$	2341	4314	4314	4314	4314	4314
$\Omega_c^0$	3340	4332	4332	4332	4332	4332
$\Omega_c^{*0}$	3341	4334	4334	4334	4334	4334
$\Xi_{cc}^+$	2440	4412			4412	4412
$\Xi_{cc}^{++}$	1440	4422			4422	4422
$\Xi_{cc}^{*+}$	2441	4414			4414	4414
$\Xi_{cc}^{*++}$	1441	4424			4424	4424
$\Omega_{cc}^+$	3440	4432			4432	4432
$\Omega_{cc}^{*+}$	3441	4434			4434	4434
$\Omega_{ccc}^{*++}$	4441	4444			4444	4444



Bottom Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Lambda_b^0$	2150	5122	5122	5122	5122	5122
$\Sigma_b^-$	2250	5112	5112	5112	5112	5112
$\Sigma_b^0$	1250	5212	5212	5212	5212	5212
$\Sigma_b^+$	1150	5222	5222	5222	5222	5222
$\Sigma_b^{*-}$	2251	5114	5114	5114	5114	5114
$\Sigma_b^{*0}$	1251	5214	5214	5214	5214	5214
$\Sigma_b^{*+}$	1151	5224	5224	5224	5224	5224
$\Xi_b^-$	3250	5132	5132	5132	5132	5132
$\Xi_b^0$	3150	5232	5232	5232	5232	5232
$\Xi_b^{\prime-}$	2350	5312	5312	5312	5312	5312
$\Xi_b^{\prime0}$	1350	5322	5322	5322	5322	5322
$\Xi_b^{*-}$	2351	5314	5314	5314	5314	5314
$\Xi_b^{*0}$	1351	5324	5324	5324	5324	5324
$\Omega_b^-$	3350	5332	5332	5332	5332	5332
$\Omega_b^{*-}$	3351	5334	5334	5334	5334	5334
$\Xi_{bc}^0$	4250	5142			5142	5142
$\Xi_{bc}^+$	4150	5242			5242	5242
$\Xi_{bc}^{\prime0}$	2450	5412			5412	5412
$\Xi_{bc}^{\prime+}$	1450	5422			5422	5422
$\Xi_{bc}^{*0}$	2451	5414			5414	5414
$\Xi_{bc}^{*+}$	1451	5424			5424	5424
$\Omega_{bc}^0$	4350	5342			5342	5342
$\Omega_{bc}^{\prime0}$	3450	5432			5432	5432
$\Omega_{bc}^{*0}$	3451	5434			5434	5434
$\Omega_{bcc}^+$	4450	5442			5442	5442
$\Omega_{bcc}^{*+}$	4451	5444			5444	5444

Bottom Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Xi_{bb}^-$	2550	5512			5512	5512
$\Xi_{bb}^0$	1550	5522			5522	5522
$\Xi_{bb}^{*-}$	2551	5514			5514	5514
$\Xi_{bb}^{*0}$	1551	5524			5524	5524
$\Omega_{bb}^-$	3550	5532			5532	5532
$\Omega_{bb}^{*-}$	3551	5534			5534	5534
$\Omega_{bbc}^0$	4550	5542			5542	5542
$\Omega_{bbc}^{*0}$	4551	5544			5544	5544
$\Omega_{bbb}^{*-}$	5551	5554			5554	5554

Top Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Lambda_t^+$	2160		6122			6122
$\Sigma_t^0$	2260		6112			6112
$\Sigma_t^+$	1260					6212
$\Sigma_t^{++}$	1160		6222			6222
$\Sigma_t^{*0}$	2261					6114
$\Sigma_t^{*+}$	1261					6214
$\Sigma_t^{*++}$	1161					6224
$\Xi_t^0$	3260		6132			6132
$\Xi_t^+$	3160		6232			6232
$\Xi_t'^0$	2360					6312
$\Xi_t'^+$	1360					6322
$\Xi_t^{*0}$	2361					6314
$\Xi_t^{*+}$	1361					6324
$\Omega_t^0$	3360		6332			6332
$\Omega_t^{*0}$	3361					6334
$\Xi_{tc}^+$	4260					6142
$\Xi_{tc}^{++}$	4160					6242
$\Xi_{tc}'^+$	2460					6412
$\Xi_{tc}'^{++}$	1460					6422
$\Xi_{tc}^{*+}$	2461					6414
$\Xi_{tc}^{*++}$	1461					6424
$\Omega_{tc}^+$	4360					6342
$\Omega_{tc}'^+$	3460					6432
$\Omega_{tc}^{*+}$	3461					6434
$\Omega_{tc}^{++}$	4460					6442
$\Omega_{tcc}^{*++}$	4461					6444

Top Baryons						
Baryon	Isajet 7.72	Pythia 6.406	Herwig 6.510	EvtGen	PDG 2006	HepPID 3.01.00
$\Xi_{tb}^0$	5260					6152
$\Xi_{tb}^+$	5160					6252
$\Xi_{tb}^{\prime 0}$	2560					6512
$\Xi_{tb}^{\prime +}$	1560					6522
$\Xi_{tb}^{*0}$	2561					6514
$\Xi_{tb}^{*+}$	1561					6524
$\Omega_{tb}^0$	5360					6352
$\Omega_{tb}^{\prime 0}$	3560					6532
$\Omega_{tb}^{*0}$	3561					6534
$\Omega_{tbc}^+$	5460					6452
$\Omega_{tbc}^{\prime +}$	4560					6542
$\Omega_{tbc}^{*+}$	4561					6544
$\Omega_{tbb}^0$	5560					6552
$\Omega_{tbb}^{*0}$	5561					6554
$\Xi_{tt}^+$	2660					6612
$\Xi_{tt}^{++}$	1660					6622
$\Xi_{tt}^{*+}$	2661					6614
$\Xi_{tt}^{*++}$	1661					6624
$\Omega_{tt}^+$	3660					6632
$\Omega_{tt}^{*+}$	3661					6634
$\Omega_{ttc}^{++}$	4660					6642
$\Omega_{ttc}^{*++}$	4661					6644
$\Omega_{ttb}^+$	5660					6652
$\Omega_{ttb}^{*+}$	5661					6654
$\Omega_{ttt}^{*++}$	6661					6664