HepPID
3.04.01
Particle ID Translation Methods

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https://savannah.cern.ch/projects/heppdt/
http://cepa.fnal.gov/psm/HepPID/

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Contents

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 2008 numbering scheme.[2]

2 Particle Numbering Scheme

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

Quarks, leptons, guage 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 B.

The PDG numbering algorithm for composite particles uses a signed 7 digit number for each particle: $\pm n n_r n_L n_{q_1} n_{q_2} n_{q_3} n_J$. $n_{q_{1-3}}$ are quark numbers used to specify the quark content. The rightmost digit, $n_J = 2\mathrm{J} + 1$, 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 $n_L = 0, 1, 2, \ldots$ 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 B.) 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 attemts to list all states needed by the Monte Carlo generators. Appendix C contains a full list of meson states and their ID numbers, up through the top quark states. Appendix D contains a full list of the baryon states.

The baryon Ξ and Ω 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.

New numbers identifying magnetic monopoles and black holes have been approved for PDG 2010. For convenience, a copy (montecarlo_2010_draft.pdf) of the 2010 Monte Carlo numbering scheme draft document is provided with the installed documentation.

A black hole in models with extra dimensions has code 5000040.

Magnetic monopoles and dyons are assumed to have one unit of Dirac monopole charge and a variable integer number $\pm n_{q_1} n_{q_2} n_{q_3}$ units of electric charge. Codes $\pm 411 n_{q_1} n_{q_2} n_{q_3} 0$ are then used when the magnetic and electrical charge sign agree and $\pm 412 n_{q_1} n_{q_2} n_{q_3} 0$ when they disagree, with the overall sign of the particle set by the magnetic charge. For now no spin information is provided.

In addition, there is a need to identify "Q-ball" and similar very exotic particles which may have large, non-integer charge. As of HepPDT 3.04.01, these particles are assigned the ad-hoc numbering $\pm 100XXXY0$, where the charge is XXX.Y.

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 (montecarlorpp.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: ±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 these generators conform closely to the new numbering scheme, some differences remain.

EvtGen defines a number of pseudo-particles which are just conglomerates used by their decay mechanisms. 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 initalized 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://pdg.lbl.gov/

[2] Particle Data Group: C. Amsler *et al.*, *Physics Letters* **B667**, (2008) 1, http://pdg.lbl.gov/2008/mcdata/mc_particle_id_contents.html

[3] 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

[4] Particle Data Group: S. Eidelman *et al.*, *Physics Letters* **B592**, (2004) 292, http://pdg.lbl.gov/2004/mcdata/mc_particle_id_contents.html

A HepPID headers

A.1 ParticleIDTranslations.hh

namespace HepPID

Free functions:

```
int translateHerwigtoPDT( const int herwigID);
int translatePDTtoHerwig( const int pid );
void writeHerwigTranslation( std::ostream & os );

int translateIsajettoPDT( const int isajetID );
int translatePDTtoIsajet( const int pid );
void writeIsajetTranslation( std::ostream & os );

int translatePythiatoPDT( const int pythiaID );
int translatePDTtoPythia( const int pid );
void writePythiaTranslation( std::ostream & os );

int translateEvtGentoPDT( const int evtGenID );
int translatePDTtoEvtGen( const int pid );
void writeEvtGenTranslation( std::ostream & os );

int translatePDGtabletoPDT( const int pdgID);
int translatePDTtoPDGtable( const int pid );
void writePDGTranslation( std::ostream & os )

int translateQQtoPDT( const int qqID);
int translatePDTtoQQ( const int pid );
int translateQQbar( const int qqID);
int translateInverseQQbar( const int pid );
void writeQQTranslation( std::ostream & os );

int translateGeanttoPDT( const int geantID);
int translatePDTtoGeant( const int pid );
```

The writeXXXTranslation functions write a list of all known particle ID translations for the specified Monte Carlo generator.

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

A.2 ParticleName.hh

namespace HepPID

Free functions:

std::string particleName(const int);
Returns the HepPID standard name.

int particleName(const std::string &);
Returns the HepPID standard ID.

void listParticleNames(std::ostream & os);
List all defined names.

bool validParticleName(const int);
Verify that this particle ID has a valid name.

bool validParticleName(const std::string &);
Verify that this particle string has a valid ID.

class ParticleNameMap;

ParticleNameMap const & getParticleNameMap();
Access ParticleNameMap for other purposes.

Only getParticleNameMap is allowed to access ParticleNameMap. ParticleNameMap is initalized by the first call to getParticleNameMap. Because the class is static, this initialization only happens once. We use a data table so that compile time is not impacted.

A.3 ParticleIDMethods.hh

namespace HepPID

Free functions:

unsigned short digit(location loc, const int &);
Return the digit at a named location in pid.

int A(const int &);
If this is an ion, return A.

int Z(const int &);
If this is an ion, return Z.

int lambda(const int &);
If this is an ion, return nLambda.

int abspid(const int &);
Return the absolute value of the particle ID.

int fundamentalID(const int &);
Extract fundamental ID (1-100) if this is a "fundamental" particle.

bool hasFundamentalAnti(const int &);
If this is a fundamental particle, does it have a valid antiparticle?

int extraBits(const int &);
Returns everything beyond the 7th digit. Mostly for internal use.

bool isValid(const int &);

Is this particle ID valid?

bool isMeson(const int &);
bool isBaryon(const int &);
bool isDiQuark(const int &);
bool isLepton(const int &);
bool isHadron(const int &);
bool isNucleus(const int &);
bool isPentaquark(const int &);
bool isSUSY(const int &);
bool isRhadron(const int &);
bool isDyon(const int &);
bool isQBall(const int &);

Is this a valid particle ID for the named particle type.

bool hasUp(const int &);
bool hasDown(const int &);
bool hasStrange(const int &);
bool hasCharm(const int &);
bool hasBottom(const int &);
bool hasTop(const int &);

Does this particle contain the named quark?

int jSpin(const int &);

Returns 2J+1, where J is the total spin.

int sSpin(const int &);

Returns 2S+1, where S is the spin.

int lSpin(const int &);

Returns 2L+1, where L is the orbital angular momentum.

int threeCharge(const int &);

Return 3 times the charge. If this is a Q-ball, return 30 times the charge.

double charge(const int &);

Return the actual charge.

B Elementary Particle Identification Code Listing

Numbers which have changed since HepPID 3.03.00 are in bold text.

Quarks and Leptons						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
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
ν_e	11	12	12	12	12	12
μ^-	14	13	13	13	13	13
ν_μ	13	14	14	14	14	14
τ^-	16	15	15	15	15	15
ν_τ	15	16	16	16	16	16
τ'^-		17		17 L^-	17	17
$\nu_{\tau'}$		18		18 ν_L	18	18
τ_L^-	10016					93
τ_R^-	20016					94

Gauge and Higgs Bosons						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
g	9	21	21	21	21 (9)	21 (9)
γ	10	22	22	22	22	22
$\gamma_{virtual}$				10022		10022
$Cerenkov$				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						
$H_L^{0\,NOTE1}$	82		26			51
Special Particles						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
G (graviton)	92	39	39		39	39
R^0		41		41	41	41
LQ^c		42			42	42
$reggeon$		110			110	110
$pomeron$		990			990	990
$odderon$					9990	9990
$blackhole^{NOTE2}$					**5000040**	**5000040**
internal code		81-99	81-91	81-99	81-100	81-100

NOTE 1: H_L^0 is redundant with h^0/H_1^0, but is given a different number in Isajet and Herwig.

NOTE 2: PDG 2010 draft numbering.

Supersymmetric Particles						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$\tilde{d}_L$	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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$\tilde{g}$	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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
π_{tech}^0		3000111			3000111	3000111
π_{tech}^+		3000211			3000211	3000211
$\pi_{tech}^{\prime 0}{}^{NOTE}$		3000221			3000221	3000221
$\eta_{tech}^{0}{}^{NOTE}$		3000331			3100221	3100221
ρ_{tech}^0		3000113			3000113	3000113
ρ_{tech}^+		3000213			3000213	3000213
a_{tech}^0		3000115				3000115
a_{tech}^+		3000215				3000215
ω_{tech}^0		3000223			3000223	3000223
V_8		3100021			3100021	3100021
$\pi_{tech_{22}}^1$		3100111			3060111	3060111
$\pi_{tech_{22}}^8$		3200111			3160111	3160111
$\rho_{tech_{11}}$		3100113			3130113	3130113
$\rho_{tech_{12}}$		3200113			3140113	3140113
$\rho_{tech_{21}}$		3300113			3150113	3150113
$\rho_{tech_{22}}$		3400113			3160113	3160113
NOTE: Newer technicolor models use $\pi_{tech}^{\prime 0}$ instead of η_{tech}^0.						

R-hadrons						
R-hadron	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$R^0_{\tilde{g}g}$					1000993	1000993
$R^0_{\tilde{g}d\bar{d}}$					1009113	1009113
$R^+_{\tilde{g}u\bar{d}}$					1009213	1009213
$R^0_{\tilde{g}u\bar{u}}$					1009223	1009223
$R^0_{\tilde{g}d\bar{s}}$					1009313	1009313
$R^+_{\tilde{g}u\bar{s}}$					1009323	1009323
$R^0_{\tilde{g}s\bar{s}}$					1009333	1009333
$R^-_{\tilde{g}ddd}$					1091114	1091114
$R^0_{\tilde{g}udd}$					1092114	1092114
$R^+_{\tilde{g}uud}$					1092214	1092214
$R^{++}_{\tilde{g}uuu}$					1092224	1092224
$R^-_{\tilde{g}sdd}$					1093114	1093114
$R^0_{\tilde{g}sud}$					1093214	1093214
$R^+_{\tilde{g}suu}$					1093224	1093224
$R^-_{\tilde{g}ssd}$					1093314	1093314
$R^0_{\tilde{g}ssu}$					1093324	1093324
$R^-_{\tilde{g}sss}$					1093334	1093334
$R^+_{\tilde{t}_1\bar{d}}$					1000612	1000612
$R^0_{\tilde{t}_1\bar{u}}$					1000622	1000622
$R^+_{\tilde{t}_1\bar{s}}$					1000632	1000632
$R^0_{\tilde{t}_1\bar{c}}$					1000642	1000642
$R^+_{\tilde{t}_1\bar{b}}$					1000652	1000652
$R^0_{\tilde{t}_1 dd_1}$					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
$R^0_{\tilde{t}_1 sd_0}$					1006311	1006311
$R^0_{\tilde{t}_1 sd_1}$					1006313	1006313
$R^+_{\tilde{t}_1 su_0}$					1006321	1006321
$R^+_{\tilde{t}_1 su_1}$					1006323	1006323
$R^0_{\tilde{t}_1 ss_1}$					1006333	1006333

Diquarks						
Diquark	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$(ud)_0$	1200	2101	2101	2101	2101	2101
$(sd)_0$	2300	3101	3101	3101	3101	3101
$(su)_0$	1300	3201	3201	3201	3201	3201
$(cd)_0$	-2400	4101		4101	4101	4101
$(cu)_0$	-1400	4201		4201	4201	4201
$(cs)_0$	-3400	4301		4301	4301	4301
$(bd)_0$	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
$(dd)_1$	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

Kaluza-Klein Excitations						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$d_L^{(1)}$		**5100001**			5100001	5100001
$u_L^{(1)}$		**5100002**			5100002	5100002
$s_L^{(1)}$		**5100003**				**5100003**
$c_L^{(1)}$		**5100004**				**5100004**
$b_L^{(1)}$		**5100005**				**5100005**
$t_L^{(1)}$		**5100006**				**5100006**
$e_L^{(1)-}$		**5100011**			5100011	5100011
$\nu_{eL}^{(1)}$		**5100012**			5100012	5100012
$\mu_L^{(1)-}$		**5100013**				**5100013**
$\nu_{\mu L}^{(1)}$		**5100014**				**5100014**
$\tau_L^{(1)-}$		**5100015**				**5100015**
$\nu_{\tau L}^{(1)}$		**5100016**				**5100016**
$d_R^{(1)}$		**6100001**			6100001	6100001
$u_R^{(1)}$		**6100002**			6100002	6100002
$s_R^{(1)}$		**6100003**				**6100003**
$c_R^{(1)}$		**6100004**				**6100004**
$b_R^{(1)}$		**6100005**				**6100005**
$t_R^{(1)}$		**6100006**				**6100006**
$e_R^{(1)-}$		**6100011**			6100011	6100011
$\nu_{eR}^{(1)}$					6100012	6100012
$\mu_R^{(1)-}$		**6100013**				**6100013**
$\tau_R^{(1)-}$		**6100015**				**6100015**
$g^{(1)}$		**5100021**			5100021	5100021
$\gamma^{(1)}$		**5100022**			5100022	5100022
$Z^{(1)0}$		**5100023**			5100023	5100023
$W^{(1)+}$		**5100024**			5100024	5100024
$h^{(1)0}$					5100025	5100025
$G^{(1)}$					5100039	5100039

Excited Particles						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
d^*		4000001			4000001	4000001
u^*		4000002			4000002	4000002
e^*		4000011			4000011	4000011
ν_e^*		4000012			4000012	4000012
G^*		5000039				4000039

Other Exotics						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
ν_{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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Θ^+						9221132
Φ^{--}						9331122

Miscellaneous Particles						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
ρ^0_{diffr}		9900110				9910113
π^+_{diffr}		9900210				9910211
ω^0_{diffr}		9900220				9910223
ϕ^0_{diffr}		9900330				9910333
J/ψ^0_{diffr}		9900440				9910443
n^0_{diffr}		9902110				9912112
p^+_{diffr}		9902210				9912212
$c\tilde{c}[3S18]$		9900443				9900443
$c\tilde{c}[1S08]$		9900441				9900441
$c\tilde{c}[3P08]$		9910441				9910441
$b\tilde{b}[3S18]$		9900553				9900553
$b\tilde{b}[1S08]$		9900551				9900551
$b\tilde{b}[3P08]$		9910551				9910551
remnant photon			98			9920022
remnant nucleon			99			9922212
Hydrogen^{NOTE1}						1000010010
Deuterium				**450000000**		1000010020
Tritium				**460000000**		1000010030
He^3				**490000000**		1000020030
α				**470000000**		1000020040
geantino				**480000000**		101
charged geantino^{NOTE2}						102
$dyon^{NOTE3}$					**411XXX0**	**411XXX0**
$dyon^{NOTE3}$					**412XXX0**	**412XXX0**
$Q-ball^{NOTE4}$						**100XXXY0**

NOTE 1: To avoid confusion, it is better to use the proton code for Hydrogen.

NOTE 2: Older versions of EvtGen used a charged geantino.

NOTE 3: PDG 2010 draft numbering. XXX is the charge.

NOTE 4: ad-hoc numbering. XXX.Y is the charge.

C Complete Meson Particle Identification Code Listing

Numbers which have changed since HepPID 3.03.00 are in bold text.

Light Mesons						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
π^0	110	111	111	111	111	111
π^+	120	211	211	211	211	211
$a_0^0(980)$		10111	9000111	**9000111**	9000111	9000111
$a_0^+(980)$		10211	9000211	**9000211**	9000211	9000211
$\pi^0(1300)$				**100111**	100111	100111
$\pi^+(1300)$				**100211**	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
$\rho^0(1450)$				**100113**	100113	100113
$\rho^+(1450)$				**100213**	100213	100213
$\pi_1^0(1600)$					9010113	9010113
$\pi_1^+(1600)$					9010213	9010213
$a_1^0(1640)$					9020113	9020113
$a_1^+(1640)$					9020213	9020213
$\rho^0(1700)/\rho^0(D)$			30113	**30113**	30113	30113
$\rho^+(1700)/\rho^+(D)$			30213	**30213**	30213	30213
$\rho^0(1900)$					9030113	9030113
$\rho^+(1900)$					9030213	9030213
$\rho^0(2150)$					9040113	9040113
$\rho^+(2150)$					9040213	9040213

Light Mesons						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$a_2^0(1320)$		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
$a_2^0(1700)$					9000115	9000115
$a_2^+(1700)$					9000215	9000215
$\pi_2^0(2100)$					9010115	9010115
$\pi_2^+(2100)$					9010215	9010215
$\rho_3^0(1690)$			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

$u\bar{u}$, $d\bar{d}$, and $s\bar{s}$ Meson admixtures						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
η	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'	**9010221**	9010221	9010221
$\eta(1295)$				**100221**	100221	100221
$f_0(1370)/f_0'$		10331	10221 $f_0^0(H)$	**10221**	10221	10221
$\eta(1405)$					9020221	9020221
$\eta(1475)$					100331	100331
$f_0(1500)$				**9020221**	9030221	9030221
$f_0(1710)$					10331	10331
$\eta(1760)$					9040221	9040221
$f_0(2020)$					9050221	9050221
$f_0(2100)$					9060221	9060221
$f_0(2200)$					9070221	9070221
$\eta(2225)$					9080221	9080221
$\omega(782)$	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
$\omega(1420)$				**100223**	100223	100223
$f_1(1510)$					9000223	9000223
$h_1(1595)$					9010223	9010223
$\omega(1650)$			30223		30223	30223
$\phi(1680)$					100333	100333

$u\bar{u}$, $d\bar{d}$, and $s\bar{s}$ Meson admixtures						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$f_2(1270)$	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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
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
$K^0(1830)$					9010311	9010311
$K^+(1830)$					9010321	9010321
$K_0^{*0}(1950)$					9020311	9020311
$K_0^{*+}(1950)$					9020321	9020321
$K^{*0}(892)$	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
$K_1^0(1650)$					9000313	9000313
$K_1^+(1650)$					9000323	9000323
$K^{*0}(1680)$			30313	30313	30313	30313
$K^{*+}(1680)$			30323	30323	30323	30323

Strange Mesons						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$K_2^{*0}(1430)$	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
$K_2^{*0}(1980)$					9010315	9010315
$K_2^{*+}(1980)$					9010325	9010325
$K_2^0(2250)$					9020315	9020315
$K_2^+(2250)$					9020325	9020325
$K_3^{*0}(1780)$			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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$\eta_c(1S)$	440	441	441	441	441	441
$\chi_{c0}(1P)$	20440	10441	10441 (χ_{c1})	10441	10441	10441
$\eta_c(2S)$				**100441**	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 (χ_{c0})	20443	20443	20443
$\psi(2S)/\psi'$	10441	100443	100443	**100443**	100443	100443
$\psi(3770)$			30443	**30443**	30443	30443
$\psi(4040)$				**9000443**	9000443	9000443
$\psi(4160)$				**9010443**	9010443	9010443
$\psi(4415)$				**9020443**	9020443	9020443
$\chi_{c2}(1P)$	20442	445	445	445	445	445
$\chi_{c2}(2P)$					100445	100445

Bottom Mesons						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
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	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 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
$\eta_b(1S)$	550	551	551	551	551	551
$\chi_{b0}(1P)$		10551	10551	10551	10551	10551
$\eta_b(2S)$				**100551**	100551	100551
$\chi_{b0}(2P)$			110551	**110551**	110551	110551
$\eta_b(3S)$				**200551**	200551	200551
$\chi_{b0}(3P)$				**210551**	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
$\Upsilon_1(1D)$				**30553**	30553	30553
$\Upsilon(2S)/\Upsilon'$		100553	100553	**100553**	100553	100553
$h_b(2P)$				**110553**	110553	110553
$\chi_{b1}(2P)$			120553	**120553**	120553	120553
$\Upsilon_1(2D)$				130553	130553	130553
$\Upsilon(3S)$			200553	**200553**	200553	200553
$h_b(3P)$				**210553**	210553	210553
$\chi_{b1}(3P)$				**220553**	220553	220553
$\Upsilon(4S)$			300553	**300553**	300553	300553
$\Upsilon(10860)$				**9000553**	9000553	9000553
$\Upsilon(11020)$					9010553	9010553
$\Upsilon(7S)$						9020553
$\chi_{b2}(1P)$		555	555	555	555	555
$\eta_{b2}(1D)$				**10555**	10555	10555
$\Upsilon_2(1D)$				**20555**	20555	20555
$\chi_{b2}(2P)$			100555	**100555**	100555	100555
$\eta_{b2}(2D)$				**110555**	110555	110555
$\Upsilon_2(2D)$				**120555**	120555	120555
$\chi_{b2}(3P)$				**200555**	200555	200555
$\Upsilon_3(1D)$				557	557	557
$\Upsilon_3(2D)$				**100557**	100557	100557

Top Mesons						
Meson	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
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
η_t	660					661
θ	661		663			663

Miscellaneous EvtGen 9.1 Particles						
Particle	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Xu^0				**43**		43
Xu^+				**44**		44
σ^0				**9000221**		**9090221**
Xsd				30343		30343
Xsu				30353		30353
Xdd						30373
Xdu						30383
Xss				30363		30363

D Baryon Particle Identification Code Listing

Numbers which have changed since HepPID 3.03.00 are in bold text.

Light Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
p	1120	2212	2212	2212	2212	2212
n	1220	2112	2112	2112	2112	2112
$N(1440)^+$					12212	12212
$N(1440)^0$					12112	12112
$N(1520)^+$					2124	2124
$N(1520)^0$					1214	1214
$N(1535)^+$					22212	22212
$N(1535)^0$					22112	22112
$N(1650)^+$					32212	32212
$N(1650)^0$					32112	32112
$N(1675)^+$					2216	2216
$N(1675)^0$					2116	2116
$N(1680)^+$					12216	12216
$N(1680)^0$					12116	12116
$N(1700)^+$					22124	22124
$N(1700)^0$					21214	21214
$N(1710)^+$					42212	42212
$N(1710)^0$					42112	42112
$N(1720)^+$					32124	32124
$N(1720)^0$					31214	31214
$N(2190)^+$					2128	2128
$N(2190)^0$					1218	1218

Light Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Δ^{++}	1111	2224	2224	2224	2224	2224
Δ^{+}	1121	2214	2214	2214	2214	2214
Δ^{0}	1221	2114	2114	2114	2114	2114
Δ^{-}	2221	1114	1114	1114	1114	1114
$\Delta(1600)^{++}$					32224	32224
$\Delta(1600)^{+}$					32214	32214
$\Delta(1600)^{0}$					32114	32114
$\Delta(1600)^{-}$					31114	31114
$\Delta(1620)^{++}$					2222	2222
$\Delta(1620)^{+}$					1212	1212
$\Delta(1620)^{0}$					2112	2112
$\Delta(1620)^{-}$					1112	1112
$\Delta(1700)^{++}$					12224	12224
$\Delta(1700)^{+}$					12214	12214
$\Delta(1700)^{0}$					12114	12114
$\Delta(1700)^{-}$					11114	11114
$\Delta(1905)^{++}$					2226	2226
$\Delta(1905)^{+}$					2126	2126
$\Delta(1905)^{0}$					1216	1216
$\Delta(1905)^{-}$					1116	1116
$\Delta(1910)^{++}$					22222	22222
$\Delta(1910)^{+}$					21212	21212
$\Delta(1910)^{0}$					22112	22112
$\Delta(1910)^{-}$					21112	21112
$\Delta(1950)^{++}$					2228	2228
$\Delta(1950)^{+}$					2218	2218
$\Delta(1950)^{0}$					1218	2118
$\Delta(1950)^{-}$					1118	1118

Strange Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Λ	2130	3122	3122	3122	3122	3122
$\Lambda(1404)$				13122	13122	13122
$\Lambda(1520)$				3124	3124	3124
$\Lambda(1600)$				23122	23122	23122
$\Lambda(1670)$				33122	33122	33122
$\Lambda(1690)$				13124	13124	13124
$\Lambda(1800)$				43122	43122	43122
$\Lambda(1810)$				53122	53122	53122
$\Lambda(1820)$				3126	3126	3126
$\Lambda(1830)$				13126	13126	13126
$\Lambda(1890)$					23124	23124
$\Lambda(2100)$					3128	3128
$\Lambda(2110)$					23126	23126

Strange Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Σ^+	1130	3222	3222	3222	3222	3222
Σ^0	1230	3212	3212	3212	3212	3212
Σ^-	2230	3112	3112	**3112**	3112	3112
$\Sigma(1660)^+$					13222	13222
$\Sigma(1660)^0$				13212	13212	13212
$\Sigma(1660)^-$					13112	13112
$\Sigma(1750)^+$					23222	23222
$\Sigma(1750)^0$				23212	23212	23212
$\Sigma(1750)^-$					23112	23112
$\Sigma^{*+}/\Sigma(1385)^+$	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	13224
$\Sigma(1670)^0$				13214	13214	13214
$\Sigma(1670)^-$					13114	13114
$\Sigma(1940)^+$					23224	23224
$\Sigma(1940)^0$					23214	23214
$\Sigma(1940)^-$					23114	23114
$\Sigma(1775)^+$					3226	3226
$\Sigma(1775)^0$				3216	3216	3216
$\Sigma(1775)^-$					3116	3116
$\Sigma(1915)^+$					13226	13226
$\Sigma(1915)^0$					13216	13216
$\Sigma(1915)^-$					13116	13116
Ξ^0	1330	3322	3322	**3322**	3322	3322
Ξ^-	2330	3312	3312	**3312**	3312	3312
$\Xi^{*0}/\Xi(1530)^0$	1331	3324	3324		3324	3324
$\Xi^{*-}/\Xi(1530)^-$	2331	3314	3314		3314	3314
Ω^-	3331	3334	3334	3334	3334	3334

Charmed Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Λ_c^+	2140	4122	4122	4122	4122	4122
$\Lambda_c(2593)$				14122	14122	14122
$\Lambda_c(2625)$				14124		14124
Σ_c^{++}	1140	4222	4222	4222	4222	4222
Σ_c^+	1240	4212	4212	4212	4212	4212
Σ_c^0	2240	4112	4112	4112	4112	4112
Σ_c^{*++}	1141	4224	4224	4224	4224	4224
Σ_c^{*+}	1241	4214	4214	4214	4214	4214
Σ_c^{*0}	2241	4114	4114	4114	4114	4114
Ξ_c^+	3140	4232	4232	4232	4232	4232
Ξ_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
Ξ_c^{*+}	1341	4324	4324	4324	4324	4324
Ξ_c^{*0}	2341	4314	4314	4314	4314	4314
Ω_c^0	3340	4332	4332	4332	4332	4332
Ω_c^{*0}	3341	4334	4334	4334	4334	4334
Ξ_{cc}^+	2440	4412		**4412**	4412	4412
Ξ_{cc}^{++}	1440	4422		**4422**	4422	4422
Ξ_{cc}^{*+}	2441	4414		**4414**	4414	4414
Ξ_{cc}^{*++}	1441	4424		**4424**	4424	4424
Ω_{cc}^+	3440	4432		**4432**	4432	4432
Ω_{cc}^{*+}	3441	4434		**4434**	4434	4434
Ω_{ccc}^{*++}	4441	4444			4444	4444

Bottom Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Λ_b^0	2150	5122	5122	5122	5122	5122
Σ_b^-	2250	5112	5112	5112	5112	5112
Σ_b^0	1250	5212	5212	5212	5212	5212
Σ_b^+	1150	5222	5222	5222	5222	5222
Σ_b^{*-}	2251	5114	5114	5114	5114	5114
Σ_b^{*0}	1251	5214	5214	5214	5214	5214
Σ_b^{*+}	1151	5224	5224	5224	5224	5224
Ξ_b^-	3250	5132	5132	5132	5132	5132
Ξ_b^0	3150	5232	5232	5232	5232	5232
$\Xi_b^{\prime -}$	2350	5312	5312	5312	5312	5312
$\Xi_b^{\prime 0}$	1350	5322	5322	5322	5322	5322
Ξ_b^{*-}	2351	5314	5314	5314	5314	5314
Ξ_b^{*0}	1351	5324	5324	5324	5324	5324
Ω_b^-	3350	5332	5332	5332	5332	5332
Ω_b^{*-}	3351	5334	5334	5334	5334	5334
Ξ_{bc}^0	4250	5142			5142	5142
Ξ_{bc}^+	4150	5242			5242	5242
$\Xi_{bc}^{\prime 0}$	2450	5412			5412	5412
$\Xi_{bc}^{\prime +}$	1450	5422			5422	5422
Ξ_{bc}^{*0}	2451	5414			5414	5414
Ξ_{bc}^{*+}	1451	5424			5424	5424
Ω_{bc}^0	4350	5342			5342	5342
$\Omega_{bc}^{\prime 0}$	3450	5432			5432	5432
Ω_{bc}^{*0}	3451	5434			5434	5434
Ω_{bcc}^+	4450	5442			5442	5442
Ω_{bcc}^{*+}	4451	5444			5444	5444

Bottom Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Ξ_{bb}^{-}	2550	5512			5512	5512
Ξ_{bb}^{0}	1550	5522			5522	5522
Ξ_{bb}^{*-}	2551	5514			5514	5514
Ξ_{bb}^{*0}	1551	5524			5524	5524
Ω_{bb}^{-}	3550	5532			5532	5532
Ω_{bb}^{*-}	3551	5534			5534	5534
Ω_{bbc}^{0}	4550	5542			5542	5542
Ω_{bbc}^{*0}	4551	5544			5544	5544
Ω_{bbb}^{*-}	5551	5554			5554	5554

Top Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Λ_t^+	2160		6122			6122
Σ_t^0	2260		6112			6112
Σ_t^+	1260					6212
Σ_t^{++}	1160		6222			6222
Σ_t^{*0}	2261					6114
Σ_t^{*+}	1261					6214
Σ_t^{*++}	1161					6224
Ξ_t^0	3260		6132			6132
Ξ_t^+	3160		6232			6232
$\Xi_t^{\prime 0}$	2360					6312
$\Xi_t^{\prime +}$	1360					6322
Ξ_t^{*0}	2361					6314
Ξ_t^{*+}	1361					6324
Ω_t^0	3360		6332			6332
Ω_t^{*0}	3361					6334
Ξ_{tc}^+	4260					6142
Ξ_{tc}^{++}	4160					6242
$\Xi_{tc}^{\prime +}$	2460					6412
$\Xi_{tc}^{\prime ++}$	1460					6422
Ξ_{tc}^{*+}	2461					6414
Ξ_{tc}^{*++}	1461					6424
Ω_{tc}^+	4360					6342
$\Omega_{tc}^{\prime +}$	3460					6432
Ω_{tc}^{*+}	3461					6434
Ω_{tcc}^{++}	4460					6442
$\Omega_{tcc}{}^{*++}$	4461					6444

Top Baryons						
Baryon	Isajet 7.79	Pythia 6.421	Herwig 6.510	EvtGen 9.1	PDG 2008	HepPID 3.04.01
Ξ_{tb}^{0}	5260					6152
Ξ_{tb}^{+}	5160					6252
$\Xi_{tb}^{\prime 0}$	2560					6512
$\Xi_{tb}^{\prime +}$	1560					6522
Ξ_{tb}^{*0}	2561					6514
Ξ_{tb}^{*+}	1561					6524
Ω_{tb}^{0}	5360					6352
$\Omega_{tb}^{\prime 0}$	3560					6532
Ω_{tb}^{*0}	3561					6534
Ω_{tbc}^{+}	5460					6452
$\Omega_{tbc}^{\prime +}$	4560					6542
Ω_{tbc}^{*+}	4561					6544
Ω_{tbb}^{0}	5560					6552
Ω_{tbb}^{*0}	5561					6554
Ξ_{tt}^{+}	2660					6612
Ξ_{tt}^{++}	1660					6622
Ξ_{tt}^{*+}	2661					6614
Ξ_{tt}^{*++}	1661					6624
Ω_{tt}^{+}	3660					6632
Ω_{tt}^{*+}	3661					6634
Ω_{ttc}^{++}	4660					6642
Ω_{ttc}^{*++}	4661					6644
Ω_{ttb}^{+}	5660					6652
Ω_{ttb}^{*+}	5661					6654
Ω_{ttt}^{*++}	6661					6664