



スーパージェット
Super-Kamiokande

SKDETSIM Secondary Bank

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scndprt bank

- Variable descriptions repeated here also available at
 - <http://www.t2k.org/t2ksk/code/ntuplevariables>
 - Documentation also in apscndry.h
- Stored by uncommenting
FILL_SECONDARY="yes" in filInt_simple.sh

Secondary Particle Information p. 1

- nscndprt : Number of secondary particles
- itrkscnd : Parent track number (GEANT) of the secondary particle
- istakscnd: Parent stack track number (GEANT) of the secondary particle
- vtxscnd : Vertex of the generated point
- pscnd : Momentum of the secondary particle
- iprtscnd : Particle code of the secondary particle
- tscnd : Generated time of the secondary particle
- iprntprt : Parent particle code of the secondary particle
- Imecscnd : Interaction code that produced the secondary particle (described in more detail later)
- iprnttrk : Parent track number (MCVECT) of the secondary particle

Secondary Particle Information p. 2

- `iorgprt` : Parent track PID code(MCVECT) of the secondary particle
- `iprntidx` : Array index (Fortran) of this secondary particle's parent
 - Negative: Index corresponding to MCVECT (NEUT) stack
 - Positive: Index corresponding to this stack
 - 0: Unmatched (E.g. muon or hadron > 10 GeV/c)
- `nchilds` : Number of daughter particles (NGKINE in GEANT)
- `ichildidx`: Array index (Fortran) in this stack of this secondary particle's first child
 - 0: No matched children
- `pprnt` : Momentum of the parent particle at interaction
- `pprntinit`: Initial momentum of the parent particle at birth
- `vtxprnt` : Vertex of the parent particle at birth

Secondary Particle Information p. 3

- iflgscond : User interaction code for better classification than Imecscnd
- Currently for pions only, following convention which is hybrid of NEUT VCWORK and FSIHIST:
- (*100 for SKDETSIM non-NEFFECT interactions e.g. elastic SGPIEL; +0 Free Hydrogen, +1 Oxygen)
 - -1 : ESCAPE
 - 0 : INITIAL (or unmatched parent vertex if l>1)
 - 3 : ABSORPTION
 - 4 : CHARGE EXCHANGE
 - 7 : HADRON PRODUCTION
 - 8 : QUASI-ELASTIC SCATTER
 - 9 : FORWARD (ELASTIC-LIKE) SCATTER
 - (Other values not assigned)
- **Caveat:** Doesn't encompass everything that pions can do (eg. Double charge exchange, hadron production), or allow for counting of total number of times that hadronic interactions occur (eg. Count number of scatters before charge exchange, etc. To do these more detailed studies need to count the charged pions at each vertex and use this to determine the interaction type).

Imecscnd p. 1

NEXT	1	particle has reached the boundary of current volume;
MULS	2	multiple scattering;
LOSS	3	continuous energy loss;
FIEL	4	bending in magnetic field;
DCAY	5	particle decay;
PAIR	6	photon pair-production or muon direct pair production;
COMP	7	Compton scattering;
PHOT	8	photoelectric effect;
BREM	9	bremsstrahlung;
DRAY	10	δ -ray production;
ANNI	11	positron annihilation;
HADR	12	hadronic interaction;
ECOH	13	hadronic elastic coherent scattering;

From GEANT3 Manual

Imecscnd p. 3

LOOP	28	not used;
NULL	29	no mechanism is active, usually at the entrance of a new volume;
STOP	30	particle has fallen below energy threshold and tracking stops;
LABS	101	Čerenkov photon absorption;
LREF	102	Čerenkov photon reflection/refraction;
SMAX	103	step limited by STEMAX;
SCOR	104	correction against loss of precision in boundary crossing;
CKOV	105	Čerenkov photon generation;
REFL	106	Čerenkov photon reflection;
REFR	107	Čerenkov photon refraction;
SYNC	108	synchrotron radiation generation;
STRA	109	PAI or ASHO model used for energy loss fluctuations.

From GEANT3 Manual

Imecscnd p. 2

EVAP	14	nuclear evaporation;
FISS	15	nuclear fission;
ABSO	16	nuclear absorption;
ANNH	17	anti-proton annihilation;
CAPT	18	neutron capture;
EINC	19	hadronic elastic incoherent scattering;
INHE	20	hadronic inelastic scattering;
MUNU	21	muon-nuclear interaction;
TOFM	22	exceeded time of flight cut;
PFIS	23	nuclear photo-fission;
SCUT	24	the particle due to bending in magnetic field was unexpectedly crossing volume boundaries and the step has been halved to avoid this;
RAYL	25	Rayleigh effect;
PARA	26	parametrisation activated;
PRED	27	error matrix computed (GEANE tracking);

From GEANT3 Manual