Root File Structure

In the Root file, one can find two Root trees,the “header tree” and the “event tree”.

Header tree

The header tree contains 8 Root branches.

name	type	description
iversn	int	EPOS version number
laproj	int	projectile atomic number Z
maproj	int	projectile mass number A
latarg	int	target atomic number Z
matarg	int	target mass number A
engy	float	center of mass energy collision (GeV)
nfull	int	number of simulation events
nfreeze	int	number of freeze out events per full hydro event

Event tree

The event tree contains 36 Root branches.

name	type	description
np	int	number of particles in the event
bim	float	centrality variable
nev	int	event number
npt	int	
ngl	int	number of Glauber collisions
kol	int	number of real EPOS collisions
sigtot	float	corresponding pp cross-section
nhard	int	number of elementary hard parton-parton scatterings
npartproj	int	number of projectile’s nucleons participants according to Glauber
nparttarg	int	number of target’s nucleons participants according to Glauber
nspecp	int	number of spectators protons according to EPOS
nspecn	int	number of spectators neutrons according to EPOS
phi	float	angle of impact parameter
phir	float	angle of EP with respect to impact parameter vector
psi2	float	polar(<cos(M*phi)>,<sin(M*phi)>) / M - pi/M; M=2
psi3	float	M=3
psi4	float	M=4
psi5	float	M=4
ecci2	float	sqrt(<cos(M*phi)>**2+<sin(M*phi)>**2); M=2
ecci3	float	M=3
ecci4	float	M=4
ecci5	float	M=5
zus	float[]	private use
px	float[]	p_x of particle
py	float[]	p_y of particle
pz	float[]	p_z of particle
e	float[]	mass of particle
x	float[]	x component of formation point
y	float[]	y component of formation point
z	float[]	z component of formation point
t	float[]	formation time
id	int	particle id (EPOS id code)
ist	int	particle status
ity	int	type of particle origin
ior	int	index of father
jor	int	index of mother

A list of EPOS id codes can be found in **$EPO/src/KWt/idt.dt** in the first column, the corresponding PDG (Physics Data Group) id codes are in the in second column.

The particle status (**ist**) value is 0 for hadron of the last generation or 1 if not ; other numbers refer to partons, Pomerons, etc. All the particle status values are described in the file **$EPO/src/KWt/istat.dt**.

Please refer to the Install instructions (`https://klaus.pages.in2p3.fr/epos4/code/install`) to get the definition of the environment variable **EPO**.

The type of particle origin (**ity**) has values

- 20-29 for particles from soft strings,
- 30-39 ffor particles rom hard strings,
- 40-59 for particles from remnants,
- 60 for particles from the fluid

The two variables **ior** and **jor** refer to the indices of father and mother of the current particle. For example for a decay $a \to b + c$, the particle a is father of both b and c, there is no mother. In case of a string formed from a parton chain $a - ... - b$, the two "end partons" a and b are father and mother of the string.