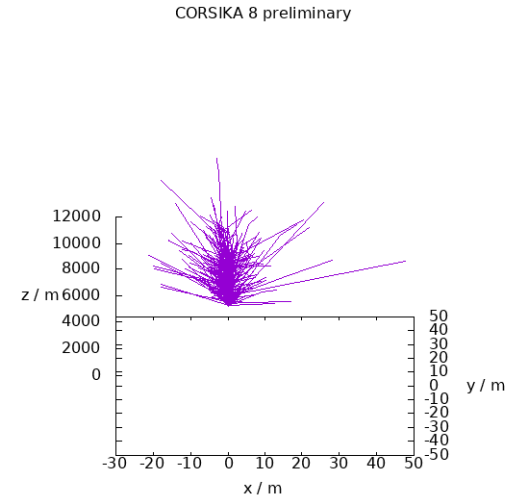# Interactions & decays

What do we have

Documentation/Examples/cascade_example.cc

```
process::sibyll::Interaction sibyll(env);
process::sibyll::NuclearInteraction sibyllNuc(env, sibyll);
//process::sibyll::Decay decay(trackedHadrons);
process::pythia::Decay decay(trackedHadrons);
ProcessCut cut(20_GeV);
```

CORSIKA 8 preliminary

Basic ingredients for particle cascade

What do we have

Documentation/Examples/cascade_example.cc

```
process::sibyll::Interaction sibyll(env);
process::sibyll::NuclearInteraction sibyllNuc(env, sibyll);
//process::sibyll::Decay decay(trackedHadrons);
process::pythia::Decay decay(trackedHadrons);
ProcessCut cut(20_GeV);
```
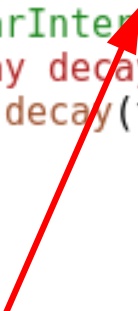
Hadronic interaction of p,n, pions + kaons
With p or nuclei up to Oxygen,
specified by environment

Link to SIBYLL

What do we have

Documentation/Examples/cascade_example.cc

```
process::sibyll::Interaction sibyll(env);
process::sibyll::NuclearInteraction sibyllNuc(env, sibyll);
//process::sibyll::Decay decay(trackedHadrons);
process::pythia::Decay decay(trackedHadrons);
ProcessCut cut(20_GeV);
```

NuclearInteraction of
Nuclei up to A=56 with
ANY target handled by
the hadronic interaction

'semi superposition'
model

Link to NUCLIB

Hadronic interaction of p,n, pions + kaons
With p or nuclei up to Oxygen,
specified by environment

Link to SIBYLL

What do we have

Documentation/Examples/cascade_example.cc

```
process::sibyll::Interaction sibyll(env);
process::sibyll::NuclearInteraction sibyllNuc(env, sibyll);
//process::sibyll::Decay decay(trackedHadrons);
process::pythia::Decay decay(trackedHadrons);
ProcessCut cut(20_GeV);
```

NuclearInteraction of
Nuclei up to A=56 with
ANY target handled by
the hadronic interaction

'semi superposition'
model

Link to NUCLIB

Hadronic interaction of p,n, pions + kaons
With p or nuclei up to Oxygen,
specified by environment

Link to SIBYLL

Particle decay

Link to PYTHIA

5

Switching implementation

Documentation/Examples/cascade_example.cc

```
process::sibyll::Interaction sibyll(env);
process::sibyll::NuclearInteraction sibyllNuc(env, sibyll);
process::sibyll::Decay decay(trackedHadrons);
//process::pythia::Decay decay(trackedHadrons);
ProcessCut cut(20_GeV);
```

Switch to SIBYLL decay routines

What is missing

Physics (discrete):

* other high energy models
* low energy model
* Pythia&Sibyll decay is done in rest frame of particle, common decays like pi,K could be done in the lab.

Framework:

* ProcessConfiguration / Boundaries between processes,
 e.g. We have dedicated PiDecay, how does Pythia::Decay know not to decay pions?
Or: I want to use Sibyll for proton interactions but Epos for pions and kaons.