



## 2 Getting Started



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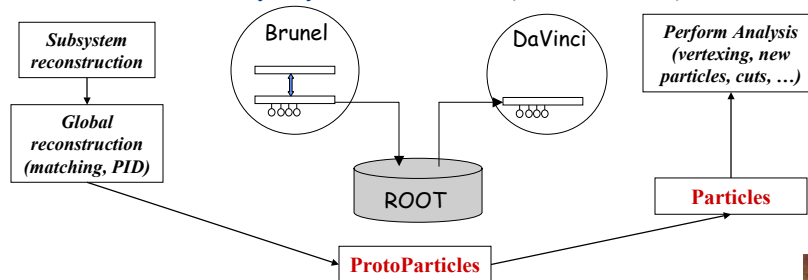
### DaVinci Package(s)

- **DaVinci is a “shell” of Gaudi like, for example, Brunel.**
  - All package and directory structure is familiar.
  - The “end-user” just programs **Algorithms** and **Tools**.
  - All “familiar” services are available
    - Job options.
    - Histograming.
    - Messaging.
    - .....
- **DaVinci takes care of data reading and package initializations that are of common use.**
- **DaVinci contains a library of tools that are of common need**
  - See next talks....



## Interface with Brunel

- Brunel writes a OO-DST (currently a ROOT file).
  - DaVinci reads the OO-DST.
    - It is programmed fully in C++
    - It is based on the Physics Event Model (the whole LHCb Event model is available as necessary)
    - Generic tools (vertexer, Kinematic Filter, etc...) are in C++
- ➡ “Everybody” should learn C++ (or at least a little)



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## ProtoParticles

- ProtoParticles are the starting point of the Physics Analysis
- ProtoParticles are the end product of the reconstruction
  - They cannot be changed by the physics analysis
- ProtoParticles have all the links to the reconstruction information used to produce them
  - They are LHCb specific and via this link can know about all detector related information
  - They are heavy and most likely a moving class
- ProtoParticles have a list of valid particleID hypothesis with their probability.
  - No particle ID is chosen at this point
  - different analysis will want to do it differently
- ProtoParticles have charge and measured kinematic information
  - A specific particleID is necessary to have all the four momentum components.

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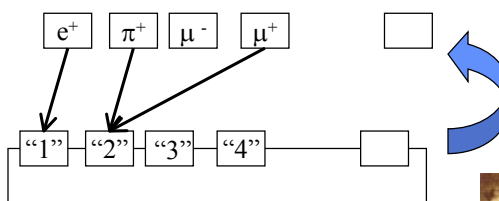
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## Particles and ProtoParticles

- A physics analysis does not interact “directly” with a ProtoParticle but with a **Particle**
  - It is possible to navigate back to the originating ProtoParticle
- A Particle has **ONE** chosen particle ID
- A physics analysis starting from DST files have a pre-processing stage to make Particles from ProtoParticles according to some “picking” criteria.
  - Different particles can originate from the same ProtoParticle

For ex: all pions with CL > 40% and all muons where muonID has the highest CL



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## First Try

- Set the DaVinci environment for the version you want to use (always)

```
DaVinciEnv v7r3
```

- Get the Gaudi Package (once)

```
getpack Phys/DaVinci v7r3
```

- Go to the cmt directory

- Execute (always)

```
source setup.csh
```

- Make the executable (once)

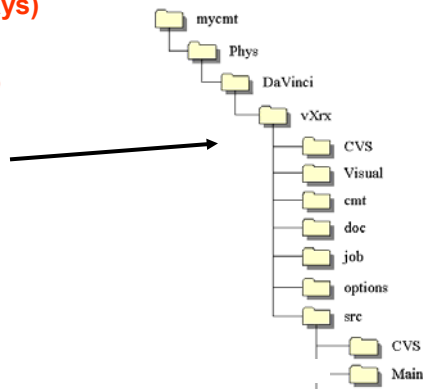
```
gmake
```

- Go to the job directory

- Execute (always)

```
DaVinci.job
```

(the current version will produce charged ProtoParticles and Primary Vertices)



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## Options File

- **Important lines in DaVinci.opts**
  - `EventSelector.Input= ...`, which selects the input file
  - `NTupleSvc.Output= ...`, which selects the output ntuple file
  - `HistogramPersistencySvc.OutputFile= ...`, which select the output histogram file
  - `ApplicationMgr.TopAlg+= ...` lines, which configure the algorithms to run.
- **Selection cuts and other variables are steered by the corresponding algorithms**



## Phys packages

