



# Requirements

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# General remarks

- **Geant3 based production is being retired**
- **Simulation framework GAUSS, interfaced with Geant4**
  - ❑ **All detectors are simulated**
  - ❑ **New version of Gauss built using the most recent tag version of Geant4 as soon as possible**
  - ❑ **Gauss in production system (Geant4 6.0)**
    - 10k events
    - 3 crashes → G4Sphere (fix provided)
- **Events produced by Gauss are processed by Boole (digitization) and Brunel (reconstruction)**
  - ❑ **Persistency with POOL**
  - ❑ **Simulation used not only for physics studies, also to understand and evolve reconstruction analysis**
- **Gauss interfaced to Pythia for pp collision and EvtGen for decays**
  - ❑ **Same particles properties in all simulation phases**

## Requirements (1)

- **The possibility of assigning new track ID (creating new particle) for hadrons undergoing inelastic scattering, in all physics lists, and steerable from the physics lists.**

**The choice should be under user control since it depends on specific studies.**

**This is necessary to understand the behavior of the tracking for example where if the leading outgoing particle has very different kinematic from the incoming particle it is misleading to see it as a single particle.**

**In cases where different behaviors of a model are a priori possible (for instance the desired changing or not changing the track ID for pions undergoing inelastic scattering), the default behavior should be clearly stated and easily switchable by the user.**

## Requirements (2)

- **All available physics processes, models, cross-sections, etc., should provide documentation of the technical aspects of the implementation: details of the expected behaviour of a model should be provided (for example how incoming and outgoing particles are handled). This applies to both hadronic and electromagnetic processes.**
- **A physics list should be implemented in a coordinated way regarding the output of the models' behavior, so that such behavior would be consistent as much as possible.**  
**For example an incoming particle should always be (or not be) killed in all inelastic scattering models of a given physics list.**  
**In the cases where this is not possible (due to specific characteristics of the models) the difference should be clearly described.**
- **When the behavior of a specific physics list depends on parameters (for example on a momentum threshold) this should be clearly documented, specifying if such parameters are fixed or under user control.**