

# FCC software

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On behalf of the FCC-SW group

# Software

- FCC SW group:
  - Established mid 2014
  - Common to FCC-ee/-hh
  - initially convened by Fabiola & P. Janot
  - Since 09/2014 C. Bernet (CMS) & B. Hegner (SFT)
- Goal:
  - Establish a SW framework for early studies and design of the FCC detectors
- Choices:
  - Gaudi as the processing framework
  - DD4HEP, xml based detector description
  - Main data model build from simple structs (POTS) as detector description input (being developed now)

# Software

- Software progress limited due to manpower, but now able to use the Framework to make simplistic truth level studies
- Simple parameterization also available
- One of the goal of the framework is to be able to choose between parameterization, fast simulation, full simulation depending on detectors
- Mailing list [fcc-experiments-sw-dev@cern.ch](mailto:fcc-experiments-sw-dev@cern.ch)
- Tutorial:  
<https://twiki.cern.ch/twiki/bin/viewauth/FCC/FccSoftware#Tutorials>
- Doodle: <http://doodle.com/was9s79pbmz8ut7d#table>
- Feedback from users are very important :
  - To help develop and debug the code
  - To understand the needs from the user and prioritize the work

# Status

- First version of the event data model has been defined.
  - Completed and could be used in the context of a running experiment
  - In particular, contains classes for gen particles and jets
- Event processing framework can be used to:
  - generate events
  - run fast jet on the generated events
  - possibly run a simple parametric simulation of your own design (e.g. jet smearing, efficiency parametrization)
  - write out selected objects for each event in a ROOT tree for further analysis.
- the current generator interface includes:
  - pythia, as an integrated generator
  - a (text) HepMC event reader
  - The integration of other tools (e.g. Madgraph, Whizard, LHE reader, pro-MC reader) is in the plans.
- Analysis frameworks are provided both in C++ and in python
- Disc space and CPU should become available

# Final comments

- Your generator-level analyses should be ported to the FCC software as soon as possible, for the following reasons:
  - **The longer you wait, the more custom code you have to write.**
    - First, this code is probably already available or being developed in the context of the FCC software.
    - Second, the more custom code you have, the more difficult it will be for you to give it up.
  - **If your analysis is based on the FCC EDM**
    - will be able to use more detailed simulations as soon as they become available
    - Delphes integration will certainly be complete by the end of the month
- Your feedback and help is very important in creating or integrating the tools we need
- We will all gain time by sharing our developments in this framework