FCCANALYSES OVERVIEW

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IDEA tracker integration in DD4hep / Key4hep

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ANALYSIS @ FCC

The physics analyses at FCC are spread through two repositories and a storage space:

- FCCAnalyses
  - General analysis code in analyzers
  - (Proto)package machinery for case studies
  - Steering of the analysis (RDataFrame)
  - Access to the (meta)data
  - Running over large datasets / on batch
- FCCeePhysicsPerformance
  - Main place for the abstracts
  - Contains very specific analysis code
  - (Proto)package repository
- Storage space on EOS `/eos/experiment/fcc`

ANALYSIS @ FCC

Supporting repositories:

- FCC-config
- EventProducer
- fcc-tutorials

Supporting data:

- `prodDict.json`
- Event statistics

EVENT PROCESSING

- The analysis is build around RootDataFrame
- It imagines the analysis as a series of transformations with functions/clojures on the data columns.
- If one writes in this fashion, the multi threading is for "free"
- Over the years a lot of analyzers have been written
- Analyzers are usually structs with dependencies like: ROOT, EDM4hep, podio, FastJet, DD4hep, ACTS, ONNX

ANALYSIS STEERING

- The analysis is divided into three steps: `stage1`, `stage2`, `final`
- The stages are objects which are loaded into "main" function with the help of `getattr()`
- The first stage reads the data in EDM4hep format
- Running on batch is done by running on-the-fly generated shell script in subprocess

PROTO PACKAGES

Example analysis is split into several locations:

- Analysis stages are in `examples` in FCCAnalyses
- Abstract and Results in `case-studies` in FCCeePhysicsPerformance
- Benchmarks are in `tests` in FCCAnalyses
- Documentation in `case-studies` in FCCeePhysicsPerformance

`Case studies` machinery allows to create (semi)independent analysis, with or without independent dependencies managed from top