

Acts project: A Common Tracking Software

General considerations:

- Detailed documentation acts.readthedocs.io
- It requires a C++17, CMake ≥ 3.14 , Boost ≥ 1.71 , Eigen $\geq 3.3.7$
- Old GIT repository at gitlab.cern.ch/acts/acts
- New GIT repository github.com/acts-project/acts
- Really fast development: v3.0.0 on 19 Nov 2020, v6.0.0 on 2 Mar 2021, ..., v23.0.0 on 18 Jan 2023
- v6.0.0 is available from LCG release, lcginfo.cern.ch/pkg/acts/ for x86_64-centos7-gcc11-opt
- The latest version can be built LCG_102b/x86_64-centos7-gcc11-opt (25 Oct 2022), see [/afs/cern.ch/work/l/lyubushk/public/ACTS/](https://afs.cern.ch/work/l/lyubushk/public/ACTS/) (to be compared: spdroot requires x86_64-centos7-gcc62-opt)

Acts project: track extrapolation

- definitions acts.readthedocs.io/en/latest/core/propagation.html
- Various algorithms are available:
 - Acts::StraightLineStepper for linear propagation without magnetic field;
 - Acts::AtlasStepper is RungeKutta algorithm for track parameters propagation through magnetic field;
 - Acts::EigenStepper provides same functionality as AtlasStepper, but it is rewritten with Eigen primitives
- Different realizations of RungeKutta algorithm:
 - ATLAS (original variant): [Tracking/TrkExtrapolation/TrkExRungeKuttaPropagator](#)
 - SPDROOT (GenFit2): [GenFit/.../trackReps/src/RKTrackRep.cc](#)
 - Acts (pure transcript from the ATLAS): [acts/.../Core/include/Acts/Propagator/AtlasStepper.hpp](#)
- Acts is ready for MT (algorithm contains no data itself, operates with states)
GenFit2 is not MT ready

Summary

- Acts is a modern toolkit for track reconstruction/propagation, vertexing etc.
- A lot of examples are available
- Using of Acts with SPDROOT requires some additional work:
move from gcc62 to gcc11
maybe changing the structure/approach