

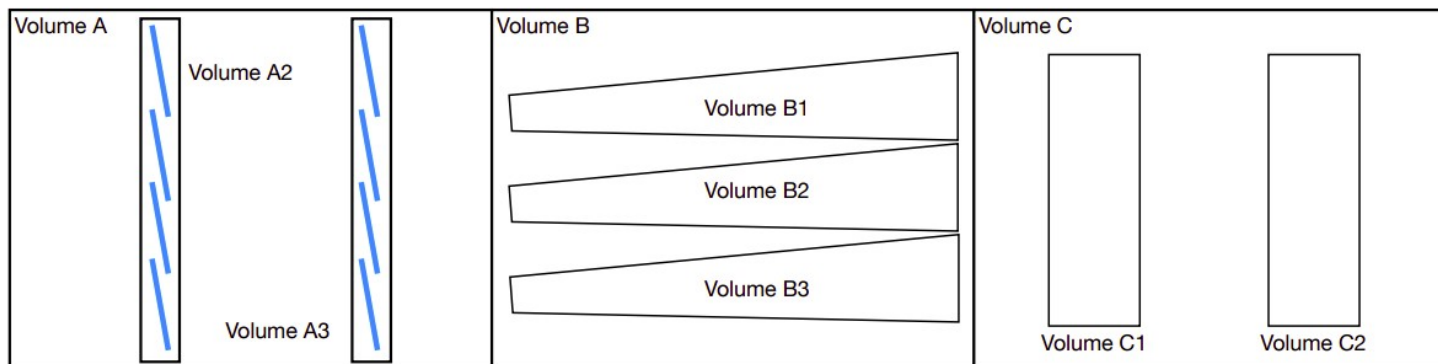
Summary of Wednesday Session Core Developments

Xiaocong Ai

ACTS Workshop 2020, May 29, 2020

The prepared list

- [Repository laundry](#) (M. Kiehn)
 - Well-defined. Could be example starting tasks for newcomers
- [Layer-free Geometry](#) (A. Salzburger)
 - Navigation structure could be much simplified
 - Concept of logical layer ID is still reserved
- [KF-based alignment](#) (X. Ai)
 - Alignment-relevant derivative calculations should be core functionality (almost done)
 - Minimization could be done by external package (e.g. Millepede II). The interface needs more investigation



Core

The following items need a discussion/decision

- Use consistent track parameter type names #151
- Fix axis enum for space points/ remove separate SpacePoint type #143
- Remove global track state information from bound parameters #35
- Towards a configurable underlying float type #156

While these items just need someone to start

- Remove obsolete parameter enums #137
- Apply naming conventions consistently.
- Replace `eLoc_0` et al. enum values with correct ones #190
- Rename the concepts namespace #42
- Clean up the version header #28
- Fix misleading material class names #29

Fatras

- Move `Interactor` to the detail namespace #11

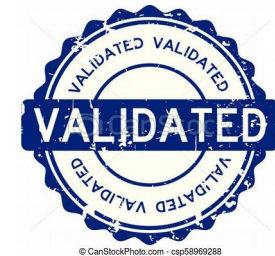
Examples

- Use `ActsExamples` namespace and update include hierarchy #130
- Use flat event data model #154
- Split event generation and simulation tools #134
- Use `std::filesystem` instead of `boost::filesystem` #193

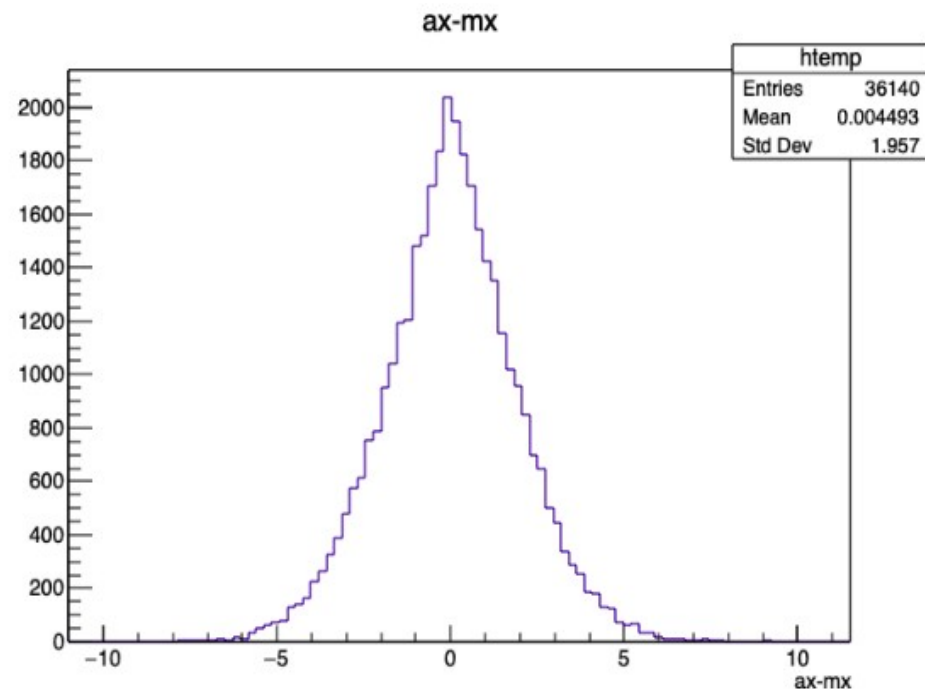
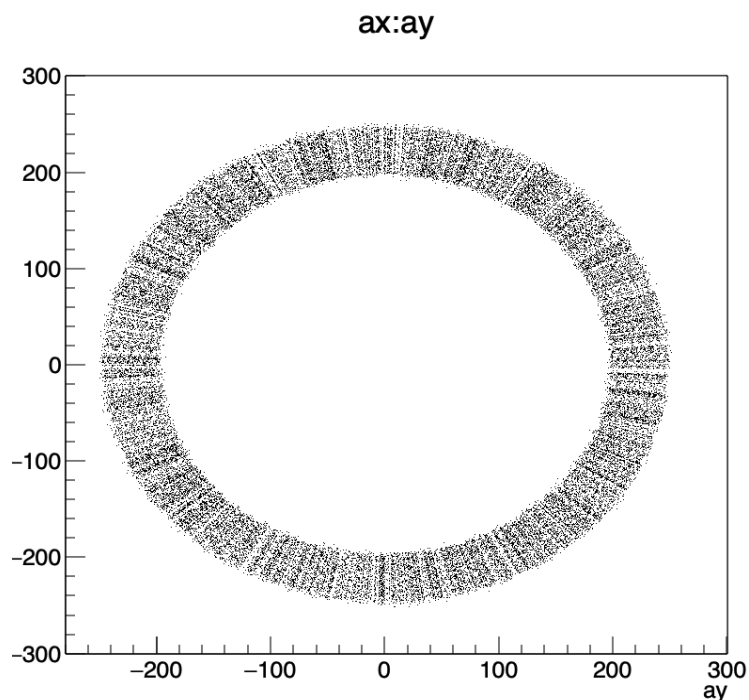


The prepared list

- [Surface-free tracking strategy for gaseous detector](#) (e.g. TPC/DC) (F. Klimpel)
 - Generalization of particle transport for free track parameters implementation (done)
 - New concept of free measurement (WIP)
 - Two approaches for KF filtering at point of closest approach
 - Global KF formalism
 - Local KF formalism still but with curvilinear track parameters



Concept of 3D measurement approacher as propagator actor has been validated by Andi!



New on the list

LET'S DO IT!!!!

- Better documentation/tutorial proves to make life easier
 - Track parameters definition (coordinate, covariance) and transform between them (bound/curvilinear to free, free to bound/curvilinear)
 - Derivative calculation for both particle transport and incoming alignment
 - Tracking features: KalmanFitter, CKF, vertexing
 - Example options (e.g. Geometry building)
 - Guidance for porting experiment measurements into ACTS
- Task classifying/labeling for contributors with different experience level
- KF debugging for CEPC/sPHENIX
 - To understand reason for observed fitting failure and nonideal momentum resolution