# Pull request and issue summary for acts-project/acts

October 8, 2024

## acts-project/acts: PRs merged between 2024-10-01 and 2024-10-08 | I

- ▶ **build:** Use 'patch' to apply patch for Annoy (#3667) by @paulgessinger, ✓ reviewed by @stephenswat, merged on 2024-10-01
- ▶ test(gx2f): remove ToyDetectorYdirection relic (#3669) by @AJPfleger, reviewed by @andiwand, merged on 2024-10-01
- ► ci: Require Sonar Analysis (#3663) by @paulgessinger, ✓ reviewed by @stephenswat, merged on 2024-10-01
- ▶ \$\infty\$ refactor!: Remove mean reduction from 'MultiEigenStepperLoop' (#3671) by @andiwand, \$\sqrt{\sqrt}\$ reviewed by @benjaminhuth, merged on 2024-10-01
- ▶ build: Use tarball download for Annoy (#3672) by @paulgessinger, ✓ reviewed by @benjaminhuth, merged on 2024-10-01
- ► For refactor: Enhance 'RootTrackParameterWriter' with residuals and pulls (#3666) by @andiwand, reviewed by @AJPfleger, merged on 2024-10-01
- ► feat(geo): TrackingVolume gets portal storage (#3673) by @paulgessinger, ✓ reviewed by @andiwand, merged on 2024-10-01

## acts-project/acts: PRs merged between 2024-10-01 and 2024-10-08 II

- ► refactor: Removed maxHits condition from ScoreBasedAmbiguitySolver (#3676) by @Ragansu, reviewed by @Corentin-Allaire, merged on 2024-10-01
- ► ci: GitLab '-j6' (#3677) by @paulgessinger, ✓ reviewed by @AJPfleger, merged on 2024-10-01
- ► chore: update license header (#3623) by @AJPfleger, ✓ reviewed by @andiwand, merged on 2024–10-01
- ▶ fix(gx2f): new error 'UsedUnreachableMeasurements' (#3653) by @AJPfleger, ✓ reviewed by @andiwand, merged on 2024-10-02
- ► feat(geo): TrackingVolume gets surface storage (#3675) by @paulgessinger, reviewed by @andiwand, merged on 2024-10-02
- ▶ fix: Fix Warning messages (#3679)
  by @CarloVarni, ✓ reviewed by @AJPfleger, merged on 2024-10-02
- ▶ refactor: use 'std::ranges:find', 'find\_if', 'find\_if\_not' (#3614) by @AJPfleger, reviewed by @paulgessinger, merged on 2024-10-02
- ► feat: Allow volume constrain for propagation (#3470) by @andiwand, ✓ reviewed by @timadye, merged on 2024-10-02

#### acts-project/acts: PRs merged between 2024-10-01 and 2024-10-08 III

- ► feat(geo): Extent designated initialization (#3680) by @paulgessinger, ✓ reviewed by @asalzburger, merged on 2024-10-03
- ► refactor: Unify proxy iterator types (#3664) by @stephenswat, reviewed by @paulgessinger, merged on 2024-10-03
- ▶ feat!: (fix + chore) streamline nSegments usage (#3419) by @asalzburger, ✓ reviewed by @paulgessinger, merged on 2024-10-03
- ▶ fix: Correct initial 'q/p' covariance term in 'TrackParamsEstimationAlgorithm' in Examples (#3665)
  by @andiwand, ✓ reviewed by @asalzburger, merged on 2024-10-03
- ► ‰ fix: Fit iterator traits for ContainerIndexIterator (#3689) by @CarloVarni, ✓ reviewed by @stephenswat, merged on 2024-10-03
- ▶ feat: Allow Style setting for IndexedSurfaceGrid in Svg (#3686) by @asalzburger, ✓ reviewed by @niermann999, merged on 2024-10-04

#### acts-project/acts: PRs merged between 2024-10-01 and 2024-10-08 IV

- ► feat: Add test for space point edm (#3690) by @CarloVarni, ✓ reviewed by @AJPfleger, merged on 2024-10-04
- ▶ **fix:** BinUtility was auto-convertible from Transform3 (#3691) by @paulgessinger, ✓ reviewed by @stephenswat, merged on 2024-10-04
- ▶ ‰ refactor!: Do not use geometry extent during seeding (#3688) by @CarloVarni, ✓ reviewed by @paulgessinger, merged on 2024-10-04
- ▶ **feat: Gen 3 portal shells** (#3564) by @paulgessinger, ✓ reviewed by @andiwand, merged on 2024-10-04
- ▶ feat!: Add a radius bin to the grid (#3662) by @CarloVarni, reviewed by @paulgessinger, merged on 2024-10-04
- ▶ **feat: Add support for Timed Clusterization** (#3654) by @CarloVarni, ✓ reviewed by @gagnonlg, merged on 2024-10-04
- ► lightharpoonup refactor(geo): Add portals + surfaces to closeGeometry and visitSurfaces (#3678) by @paulgessinger, reviewed by @asalzburger, merged on 2024-10-04
- ► refactor: use std::atan2 instead of atan2f (#3695) by @CarloVarni, reviewed by @paulgessinger, merged on 2024-10-06

## acts-project/acts: PRs merged between 2024-10-01 and 2024-10-08 V

- ▶ refactor: set convertMaterial as configurable (#3604) by @galocco, reviewed by @asalzburger, merged on 2024-10-07
- ▶ refactor(geo): Geometry visualization update (#3681) by @paulgessinger, reviewed by @benjaminhuth, merged on 2024-10-07
- ▶ % refactor(geo): Teach ProtoLayer to respect local coordinate system (#3697) by @paulgessinger, reviewed by @asalzburger, merged on 2024-10-07
- ▶ build: Use correct GM variables in cmake config (#3699) by @paulgessinger, reviewed by @CarloVarni, merged on 2024-10-08
- ▶ **feat: GeoModel changes for Gen1 ITk** (#3685) by @benjaminhuth, ✓ reviewed by @paulgessinger, merged on 2024-10-08
- ▶ **feat:** add some SVG glue code to help displaying proto material (#3692) by @asalzburger, ✓ reviewed by @niermann999, merged on 2024-10-08

#### acts-project/acts: Open PRs I

- by @jmcarcell, no reviewer, updated on 2024-10-08
- ▶ \$\int \text{ fix: Copy whole trackstate did not copy calibrated (#3693)} by @benjaminhuth, \$\times\$ changes requested by @paulgessinger, updated on 2024-10-08
- ▶ ↑ refactor: Do not insert space points if not inside grid boundaries (#3698) by @CarloVarni,review requested, updated on 2024-10-08
- ▶ **[** feat(util): Add builder class for "chain" delegates (#3696) by @paulgessinger,review requested, updated on 2024-10-07
- ▶ \$\int \text{fix!: Use 'ActsScalar' in binning tools} (#3482) by @stephenswat, \$\square\$ comment by @stephenswat, updated on 2024-10-04
- ▶ **feat: Conversion and chain code in traccc** (#3656) by @stephenswat, comment by @asalzburger, updated on 2024-09-30
- ▶ ↑ refactor: Move MLAmbiguitySolver to Core (#3272) by @Corentin-Allaire, ✓ comment by @Corentin-Allaire, updated on 2024-09-27
- ▶ \$\infty\$ feat: traccc plugin refactor, traccc chain reconstruction only, and fixes (#3505) by @fredevb, \infty\$ no reviewer, updated on 2024-09-26

#### acts-project/acts: Open PRs II

- ▶ \$\times\$ perf: Use MBF smoother by default in 'TrackHelpers' in Examples track finding (#3582) by @andiwand, comment by @paulgessinger, updated on 2024-09-25
- ▶ Stale ci: Reenable some ExaTrkX tests (#3395) by @benjaminhuth, no reviewer, updated on 2024-09-21
- ► \$\int\text{Stale}\$ fix: Require TBB to be found by cmake (#3507) by @benjaminhuth, \( \sqrt{\text{v}}\) reviewed by @timadye, updated on 2024-09-21
- ► Stale feat: GeoShapes to DetectorVolumes and GeoMaterial Converters (#3268) by @Matthewharri, ✓ comment by @Matthewharri, updated on 2024-09-18
- ▶ \$\infty\$ feat: Add a fastjet plugin (#3617) by @gagnonlg, no reviewer, updated on 2024-09-17
- ► \$\infty\$ Stale feat: allow bare Surface pointers to be written to JSON (#3493) by @asalzburger, comment by @paulgessinger, updated on 2024-09-07
- ► \$\int \text{Stale} \text{ feat: traccc plugin (conversion)} (#3281) by \text{ 0fredevb, \$\sqrt{\text{comment by 0paulgessinger, updated on 2024-08-31}}

## acts-project/acts: Open PRs III

- ► Stale fix: detray plugin (cmake flags, CI, and compile errors) (#3363) by @fredevb, ✓ comment by @EleniXoch, updated on 2024-08-31
- ► Stale feat: Introduce the usage of the geomodel converters for the Muon System (#3348) by @dimitra97, ✓ comment by @dimitra97, updated on 2024-08-23
- ► Stale refactor: Lift GenericDetector to a Plugin (#3425) by @benjaminhuth,review requestedreview requested, updated on 2024-08-21
- Stale feat: traccc chain in examples (common chain logic and CPU chain) (#3320) by @fredevb, no reviewer, updated on 2024-08-15
- ► \$\times\$ Stale feat: introduction obj simhit writer (#3180) by @asalzburger, \(\begin{array}{c}\) no reviewer, updated on 2024-06-15
- by @paulgessinger, no reviewer, updated on 2024-10-07

# acts-project/acts: Open PRs IV

- by @andiwand, no reviewer, updated on 2024-10-04
- ▶ \$\frac{\sqrt{\text{WIP}}}{\text{wip}}\$ feat: Add 'estimateTrackParamCovariance' to Core (#3683) by @andiwand, \$\sqrt{\text{\text{Comment}}}\$ comment by @paulgessinger, updated on 2024-10-04
- ▶ \$\frac{1}{100}\$ WIP Stale feat: detray plugin surface grids (#3429) by @EleniXoch, ✓ comment by @EleniXoch, updated on 2024-10-04
- ▶ \$\frac{\sqrt{\text{WIP}}}{\text{will}}\$ Stale feat: GeoModel plugin changes for ITk building. (#3519) by @benjaminhuth, \$\sqrt{\text{comment}}\$ comment by @paulgessinger, updated on 2024-10-03
- ▶ \$\infty \text{WIP} fix: Guarantee angle periodicity after KF filtering and smoothing (#3684) by @andiwand, \textstyle comment by @AJPfleger, updated on 2024-10-03

# acts-project/acts: Open PRs V

- by @andiwand, no reviewer, updated on 2024-10-02
- ▶ \$\times \text{WIP} refactor: modernise map utils (#3615)} by @AJPfleger, \$\text{V}\$ comment by @AJPfleger, updated on 2024-10-02}
- ▶ ↑ WIP refactor(material)!: update slabs from 'float' to 'ActsScalar' (#3609) by @AJPfleger, ↑ no reviewer, updated on 2024-10-02
- by @paulgessinger, no reviewer, updated on 2024-10-02
- ▶ \$\times \text{WIP} \text{ Stale refactor: Detector Element refactoring proposal (#3574)} by @benjaminhuth, \$\times\$ comment by @asalzburger, updated on 2024-09-28
- by @timadye, comment by @timadye, updated on 2024-09-24

# acts-project/acts: Open PRs VI

- by @paulgessinger,review requested, updated on 2024-09-24

- ▶ 1 WIP Stale refactor: Rework detector handling in Examples (#3498) by @andiwand, no reviewer, updated on 2024-09-07
- ▶ \$\times \text{WIP} \text{ Stale refactor: Rework physics performance monitoring for Examples (#3359)} by @andiwand, \text{\lambda no reviewer}, updated on 2024-08-17}

#### acts-project/acts: Open PRs VII

- by @benjaminhuth, no reviewer, updated on 2024-08-17
- by @fredevb, no reviewer, updated on 2024-08-16
- by @fredevb, no reviewer, updated on 2024-08-16
- ▶ ↑ WIP Stale refactor: Some internal GSF refactorings (#2697) by @benjaminhuth, ★ changes requested by @andiwand, updated on 2024-07-21
- by @benjaminhuth, comment by @benjaminhuth, updated on 2024-05-25

#### acts-project/acts: New stale Issues / PRs since 2024-10-01 |

- by @benjaminhuth, no reviewer, updated on 2024-10-03
- ▶ 1 WIP Stale refactor!: Decouple navigation and stepping (#3449) by @andiwand, ↑ no reviewer, updated on 2024-10-06
- by @EleniXoch, no reviewer, updated on 2024-10-04

#### acts-project/acts: All stale Issues / PRs I

- ▶ 1 WIP Stale refactor!: Decouple navigation and stepping (#3449) by @andiwand, ↑ no reviewer, updated on 2024-10-06
- by @EleniXoch, no reviewer, updated on 2024-10-04
- ▶ \$\frac{1}{100}\$ WIP Stale feat: GeoModel plugin changes for ITk building. (#3519) by @benjaminhuth, \( \hrac{1}{100}\$ no reviewer, updated on 2024-10-03
- ▶ 1 WIP Stale feat: Adding efficiency vs production radius to output root files (#3539) by @AichaMattouhi, ↑ no reviewer, updated on 2024-09-28
- by @benjaminhuth, no reviewer, updated on 2024-09-28
- Stale TrackAtVertex trackWeight is not being written in IVF (#2149) by @andiwand, updated on 2024-09-27

#### acts-project/acts: All stale Issues / PRs II

- ► Stale 'TrackStateType' is easy to get wrong (#3439) by @andiwand, updated on 2024-09-26
- Stale Cleanup: BinningValue, AxisBounds + detray/Integration (#3549) by @asalzburger, updated on 2024-09-25
- ► \$\times\$ Stale ci: Reenable some ExaTrkX tests (#3395) by @benjaminhuth, no reviewer, updated on 2024-09-21
- ▶ \$\frac{\sqrt{WIP}}{\sqrt{WIP}}\$ Stale feat: Add statistics to propagation (#3450) by @andiwand, \$\hat{\chi}\$ no reviewer, updated on 2024-09-21
- by @CENcll, no reviewer, updated on 2024-09-21
- ▶ **Stale** 'common' CMake preset requires ccache (#3537) by @stephenswat, updated on 2024-09-21

#### acts-project/acts: All stale Issues / PRs III

- Stale fix: Require TBB to be found by cmake (#3507) by @benjaminhuth, no reviewer, updated on 2024-09-21
- ► Stale feat: GeoShapes to DetectorVolumes and GeoMaterial Converters (#3268) by @Matthewharri, ↑ no reviewer, updated on 2024-09-18

- ▶ \$\times\$ Stale feat: allow bare Surface pointers to be written to JSON (#3493) by @asalzburger, ↑ no reviewer, updated on 2024-09-07
- Stale 'GlobalChiSquareFitter' produces parameters in wrong volume (#3444) by @andiwand, updated on 2024-09-05

# acts-project/acts: All stale Issues / PRs IV

- ▶ \$\int \text{Stale} \text{ feat: traccc plugin (conversion) (#3281)} by \text{ @fredevb, \text{\lefth} no reviewer, updated on 2024-08-31}
- ► \$\frac{1}{1}\$ Stale fix: detray plugin (cmake flags, CI, and compile errors) (#3363) by @fredevb, \(\hat{\text{n}}\) no reviewer, updated on 2024-08-31
- ► \$\frac{\tag{\tag{5}}}{\tag{5}}\$ Stale feat: Introduce the usage of the geomodel converters for the Muon System (#3348) by @dimitra97, \$\frac{\tag{\tag{5}}}{\tag{6}}\$ no reviewer, updated on 2024-08-23
- ► \$\times \text{WIP} \text{ Stale} \text{ feat: Added possibility to keep intermediate particles from PythiaGenerator WIP (#3414)} by @pbutti, \text{ no reviewer, updated on 2024-08-22}
- Stale refactor: Lift GenericDetector to a Plugin (#3425) by @benjaminhuth, no reviewer, updated on 2024-08-21
- by @benjaminhuth, no reviewer, updated on 2024-08-17

# acts-project/acts: All stale Issues / PRs V

- by @fredevb, no reviewer, updated on 2024-08-16
- by @fredevb, no reviewer, updated on 2024-08-16
- Stale feat: traccc chain in examples (common chain logic and CPU chain) (#3320) by @fredevb, no reviewer, updated on 2024-08-15
- ► Stale Provide tools & setup for tracking of Heavy Ion on ITk events in standalone ACTS environment (#1778) by @tboldagh, updated on 2024-07-24
- by @benjaminhuth, no reviewer, updated on 2024-07-21
- by @CouthuresJeremy, no reviewer, updated on 2024-07-11
- Stale Project build flags are difficult to control (2024.05.29.) (#3231) by @krasznaa, updated on 2024-07-04

# acts-project/acts: All stale Issues / PRs VI

- Stale [bug] Off axis endcap with dd4hep plugin. (#942) by @whit2333, updated on 2024-06-26
- Stale Reproducibility test using hash checks for non-linear KF (#1246) by @paulgessinger, updated on 2024-06-25

- Stale Add Primary Vertex Label to tracks (#1544) by @Lucas-Borgna, updated on 2024-06-25

## acts-project/acts: All stale Issues / PRs VII

- Stale Construct tracking geometry from python (#2173)
   by @andiwand, updated on 2024-06-25

- Stale Bug: AMVF 'deleteLastVertex' might be wrong (#2380) by @andiwand, updated on 2024-06-25
- ▶ Stale [Bug] Fatras can't seem to handle energy loss for electrons on thin surfaces (#2498) by @janheinri, updated on 2024-06-25
- ► Stale [Feature Request] Padding utility for field map in case tracking volume is larger than a given field map (#2523) by @janheinri, updated on 2024-06-25
- Stale Bug: Fatras sets step size to 0 (#2543) by @andiwand, updated on 2024-06-25

## acts-project/acts: All stale Issues / PRs VIII

- Stale bug: KF verbosity statement (#3097) by @osbornjd, updated on 2024-06-20
- Stale feat: introduction obj simhit writer (#3180) by @asalzburger, no reviewer, updated on 2024-06-15
- ▶ **Stale EDM Memory usage** (#1516) by @paulgessinger, updated on 2024-05-25
- by @benjaminhuth, no reviewer, updated on 2024-05-25
- Stale Write Fatras documentation (#2796)
   by @andiwand, updated on 2024-05-25

## acts-project/acts: All stale Issues / PRs IX

- Stale bug: documentation always builds in '<source>' (#2798) by @AJPfleger, updated on 2024-05-25
- Stale Documentation on geometry misalignments (#2940) by @paulgessinger, updated on 2024-05-17
- Stale Bug: material map auto tuning only considers the "Default" mapping type (#2942) by @plariono, updated on 2024-05-17
- ▶ **Stale bug: some dependencies in setup script wrong** (#3014) by @AJPfleger, updated on 2024-05-17
- Stale perf: CKF general (#3082) by @andiwand, updated on 2024-05-05
- ▶ Stale Some 'toStream' implementations change the state of 'std::ostream' (#3079) by @andiwand, updated on 2024-05-04

# acts-project/acts: All stale Issues / PRs X

- ► Stale HepMC plugin looks incomplete (#3050) by @andiwand, updated on 2024-04-26
- ► Stale 'EigenStepper' (and extensions) cannot be easily extended for dense environment covariance transport (#2868) by @andiwand, updated on 2024-03-20
- Stale 'Stepper' and 'Navigator' cannot be configured by 'PropagatorOptions' (#2861) by @andiwand, updated on 2024-02-09
- Stale 'AdaptiveGridTrackDensity' has a hidden 'd0' cut (#2840) by @andiwand, updated on 2024-01-17
- Stale EDM4hep parameter conversion should use jacobians directly (#2813) by @paulgessinger, updated on 2024-01-11
- ► Stale 'Surface::boundToFreeJacobian' could also use 'FreeVector' parameters (#2810) by @andiwand, updated on 2024-01-10

## acts-project/acts: All stale Issues / PRs XI

- Stale Telescope detector cookbook (#2800) by @paulgessinger, updated on 2024-01-10
- ▶ **Stale** Write CKF documentation (#2794) by @paulgessinger, updated on 2024-01-10
- Stale Add description of Blueprint tree and how it can be used to create layerless detector. (#2785)
  by @paulgessinger, updated on 2024-01-10
- ► Stale 'SurfaceReached' aborter is messing with the step size (#2738) by @andiwand, updated on 2023-12-28
- Stale Propagation state cannot be initialized outside the propagation (#2736) by @andiwand, updated on 2023-12-28
- Stale FPE: AMVF keepNewVertex (#2590) by @andiwand, updated on 2023-11-26
- Stale Track finding rework (#2320) by @paulgessinger, updated on 2023-11-11

#### acts-project/acts: All stale Issues / PRs XII

- Stale Propagator step count limit reached and Step size adjustment exceeds maximum trials (#2469)
  - by @CarloVarni, updated on 2023-11-11
- ► Stale [Feature Request] Reference surface for tracking algorithm is hardcoded to be at origin (#2525)
  - by @janheinri, updated on 2023-11-09

- ▶ **Stale FPE: Bethe-Heithler gamma\_distribution** (#2346) by @paulgessinger, updated on 2023-09-03

## acts-project/acts: All stale Issues / PRs XIII

- Stale Move some Digitization code from FATRAS to Core? (#2230) by @benjaminhuth, updated on 2023-07-28
- Stale MultiTrajectory buffer default constructible (#2154) by @tboldagh, updated on 2023-07-20
- ▶ Stale Track nDoF only returns the sum of calibrated size and not the actual DoFs. (#2076) by @pbutti, updated on 2023-06-22
- ► Stale Track parameter estimation algorithm return parameter on the first seed SP surface (#2037)
  by @Corentin-Allaire, updated on 2023-05-25
- Stale Expose individual steps of track reconstruction in full\_chain python scripts (#1997)
   by @tboldagh, updated on 2023-05-20
- Stale Different results for full\_chain\_itk when running locally vs lxplus (#1819) by @CarloVarni, updated on 2023-05-09

# acts-project/acts: All stale Issues / PRs XIV

- Stale vertex fitting and duplicate tracks (#1992) by @rubihason, updated on 2023-05-09
- ▶ **Stale** Estimate Track Parameters from Seeds use only one surface. What about strips? (#1895) by @CarloVarni, updated on 2023-05-09
- Stale Bug: Unpredicatable navigation in layer with overlapping surface (#1852)
   by @Corentin-Allaire, updated on 2023-03-25
- ▶ **Optimal seeding parameters for a detector** (#1699) by @CouthuresJeremy, updated on 2023-01-05
- Stale Particle smearing assertion with Geant4 (#1603) by @benjaminhuth, updated on 2022-12-21
- Stale Documentation update: Examples (#1420) by @paulgessinger, updated on 2022-11-23
- Stale Documentation update: How-to (core) (#1422) by @paulgessinger, updated on 2022-11-23

# acts-project/acts: All stale Issues / PRs XV

- Stale Documentation update: Plugins (#1421) by @paulgessinger, updated on 2022-10-22
- ▶ Stale Vertexing produces vertex candidates that are unreasonable (#1361) by @paulgessinger, updated on 2022-10-22
- ► Stale Optionally have the vertex finding recalculate perigee parameters relative to consistent reference (#1482) by @paulgessinger, updated on 2022-10-01
- Stale Fatras: Bethe-Heitler calculation wrong? (#1437) by @asalzburger, updated on 2022-09-20
- ▶ Stale Some writers performs their writes in the destructor (#881) by @paulgessinger, updated on 2022-08-11
- ▶ **Stale** Magnetic Field Storage (#1239) by @osbornjd, updated on 2022-06-12
- Stale Cut tube segment dd4hep conversion tests (#1146) by @rahmans1, updated on 2022-05-25

## acts-project/acts: All stale Issues / PRs XVI

- Stale Bug: issue on first build after DD4hep update on system with globaly installed acts (#1139) by @gagnonlg, updated on 2022-02-22
- Stale Should seed finding tools have a higher-level interface? (#988) by @stephenswat, updated on 2021-11-25
- Stale Improvement: Estimate track parameters from seed at perigee surface (#1036) by @XiaocongAi, updated on 2021-11-10