

# ats Introduction & News

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# PRs | 08/06/21 - 22/06/21

A screenshot of a GitHub pull request list with seven entries. Red arrows point from text annotations on the right to specific parts of the PRs. The PRs are:

- fix: GdmlGeantinoRecording does not need DD4hep** ✓ #843 by paulgessinger was merged 5 days ago
- ci: Disable codecov-patch check** ✓ #842 by paulgessinger was merged 6 days ago
- perf: Add track summary root writer and standalone script for reco performance plots** ✓ #841 by XiaocongAi was merged 5 days ago
- fix: Search of last measurement index** ✗ #840 by XiaocongAi was merged 8 days ago. Labels: Component - Core, Impact - Minor
- fix: trackAverage when surface has zero binning** ✗ #839 by XiaocongAi was merged 11 days ago. Labels: Component - Core, Impact - Minor
- fix: Root readers ensure event ordering is consistent** ✗ #837 by XiaocongAi was merged 12 days ago. Labels: Component - Examples, Impact - Minor
- feat: Allow the writing of Json object to Cbor** ✓ #836 by Corentin-Allaire was merged 13 days ago. Labels: Component - Examples, Component - Plugins, Feature, Improvement
- fix: Remove Geant4 data archive after extraction** ✗ #835 by HadrienG2 was merged 14 days ago. Labels: Bug, Component - Examples, Impact - Minor

Decouples Gdml building from DD4hep

Codecov-check is switched off

Performance writing update

Fix to CKF

Bugfix to CKF

Work on ROOT reading for performance tuning

Possibility to write binary JSON format

Cleanup of G4 data folder

# Release v9.0.0 | 10/06/21

## ⚠ BREAKING CHANGES

- Refactor of the template for the input measurements in the CKF findTracks invocation. ([b00d3dd](#), [#830](#))

It implements a source link accessor concept which has:

- type members including Container, Key, Value, Iterator
- lookup methods including count, range and at to help access the source link container

The CKF findTracks is changed to be templated on the source link accessor. In this way, the input measurements can be directly used by the CKF Actor without further internal converting as long as proper accessor is provided.

- The constructor and public members of Acts::Navigator change ([641e00c](#), [#826](#))

When before it could be created like

```
Acts::Navigator nav{tGeometry};
```

```
nav.resolveSensitive = true;
```

```
nav.resolveMaterial = true;
```

```
nav.resolvePassive = true;
```

it must now be created like

```
Acts::Navigator::Config cfg;
```

```
cfg.trackingGeometry = tGeometry;
```

```
nav.resolveSensitive = true;
```

```
nav.resolveMaterial = true;
```

```
nav.resolvePassive = true;
```

```
Acts::Navigator nav{cfg};
```

Since trackingGeometry is the first member of Acts::Navigator::Config, if you don't want to change the resolve\* values, you can also write

```
Acts::Navigator nav{{tGeometry}};
```

Measurement provider for CKF becomes template

Constructor of navigator changed

## B Field access & instantiation changed



- The instantiation of an interpolated B field changes. ([ba385e3](#), [#828](#))

Old:

```
using Grid_t = detail::Grid<Vector3, detail::EquidistantAxis, detail::EquidistantAxis>;  
  
using Mapper_t = InterpolatedBFieldMapper<Grid_t>;  
  
using BField_t = InterpolatedBFieldMap<Mapper_t>;  
  
Grid_t g(std::make_tuple(std::move(r), std::move(z)));  
  
Mapper_t mapper(transformPos, transformBField, std::move(g));  
  
BField_t::Config config(std::move(mapper));  
  
config.scale = 1.;
```

```
BField_t b(std::move(config));
```

New:

```
using Grid_t = detail::Grid<Vector3, detail::EquidistantAxis, detail::EquidistantAxis>;  
  
using BField_t = InterpolatedBFieldMap<Grid_t>;  
  
Grid_t g(std::make_tuple(std::move(r), std::move(z)));  
  
BField_t::Config cfg;  
  
cfg.transformPos = transformPos;  
  
cfg.transformBField = transformBField;  
  
cfg.grid = std::move(g);  
  
cfg.scale = 1.;
```

- B field access returns Result ([b6371e2](#), [#825](#))

- The signature of field query methods in MagneticFieldProvider changes from

```
virtual Vector3 getField(const Vector3& position, Cache& cache) const = 0;
```

```
virtual Vector3 getFieldGradient(const Vector3& position, ActsMatrix<3, 3>& derivative, Cache& cache) const = 0;
```

to

```
virtual Result<Vector3> getField(const Vector3& position, Cache& cache) const = 0;
```

```
virtual Result<Vector3> getFieldGradient(const Vector3& position, ActsMatrix<3, 3>& derivative, Cache& cache) const = 0;
```

- InterpolatedBFieldMap::getMin and InterpolatedBFieldMap::getMax now return the extent of the valid **interpolation domain**, rather than the raw grid extent.

- Acts::MagneticFieldProvider loses two pure virtual overloads ([815bb72](#), [#819](#))

```
virtual Vector3 getField(const Vector3& position) const = 0;
```

```
virtual Vector3 getFieldGradient(const Vector3& position, ActsMatrix<3, 3>& derivative) const = 0;
```

Clients of generic magnetic field providers need to be adapted.

# Finally ...

Computing and Software for Big Science

em Editorial Manager

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... on the brink of submission!

# Upcoming meetings | 22/06/21 - 29/06/21



## Acts Parallelization Meeting

 Friday 25 Jun 2021, 16:00 → 17:15 Europe/Zurich

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**Videoconference Rooms**  Acts Parallelization Meeting [▶ Join](#) 

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**16:00** → 16:10 **Introduction**  10m 

Speaker: Paul Gessinger (CERN)