

Doxygen tool for ATLAS Offline Software

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ATLAS S&C Documentation Workshop

Documenting Code

- ▶ It helps others
- ▶ It helps yourself
- ▶ It is easy and intuitive with Doxygen
- ▶ It helps structuring our million lines of code

Why Documenting Code?

- ▶ Help people understand...
 - ▶ your class's **purpose**
 - ▶ your class's **interface**
 - ▶ your class's **internals**, if needed

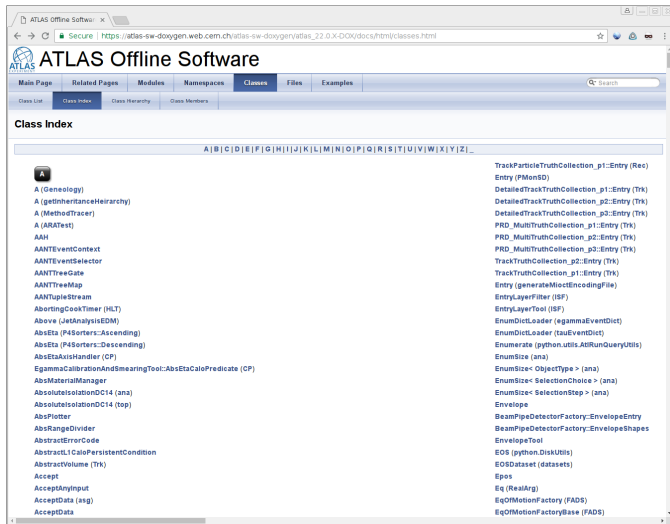
- ▶ Target audience
 - ▶ **Users** (only using code, not writing)
 - ▶ **Novice programmers** (new in Collaboration / new to the topic)
 - ▶ **Expert programmers** (new to the topic)
 - ▶ **External users** (if the ATLAS code will be *open* to public)

- ▶ **Future-proofing** for your later self and others

What is Doxygen?

- ▶ Mark-up language for documenting code **in source**
- ▶ Suitable for:
 - ▶ Projects; Classes; Files
 - ▶ Methods / functions; Variables
 - ▶ Everything else
- ▶ Generates a documentation for a code base automatically, steered and annotated by the users' Doxygen special commands (keywords)
- ▶ Easy to use: descriptive commands, little overhead
- ▶ Output options: **HTML**, LaTeX, RTF, XML, Man page, DocBook





ATLAS Offline Software

Secure | https://atlas-sw-doxygen.web.cern.ch/atlas-sw-doxygen/atlas_22.0.X-DOX/docs/html/classes.html

ATLAS Offline Software

Main Page | Related Pages | Modules | Namespaces | **Classes** | Files | Examples

Class List | **Class Index** | Class Hierarchy | Class Members

Class Index

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | _

A

- A (Geneology)
- A (getInheritanceHeirarchy)
- A (MethodTracer)
- A (ARATest)
- AAH
- AANTEventContext
- AANTEventSelector
- AANTreeGate
- AANTreeMap
- AANTupleStream
- AbortingCookTimer (HLT)
- Above (JetAnalysisEDM)
- AbsEta (P4Sorters:Ascending)
- AbsEta (P4Sorters:Descending)
- AbsEtaAxisHandler (CP)
- EgammaCalibrationAndSmearingTool:AbsEtaCaloPredicate (CP)
- AbsMaterialManager
- AbsoluteIsolationDC14 (ana)
- AbsoluteIsolationDC14 (top)
- AbsPlotter
- AbsRangeDivider
- AbstractErrorCode
- AbstractL1CaloPersistentCondition
- AbstractVolume (Trk)
- Accept
- AcceptAnyInput
- AcceptData (asg)
- AcceptData
- TrackParticleTruthCollection_p1::Entry (Rec)
- Entry (PMonSD)
- DetailedTrackTruthCollection_p1::Entry (Trk)
- DetailedTrackTruthCollection_p2::Entry (Trk)
- DetailedTrackTruthCollection_p3::Entry (Trk)
- PRD_MultiTruthCollection_p1::Entry (Trk)
- PRD_MultiTruthCollection_p2::Entry (Trk)
- PRD_MultiTruthCollection_p3::Entry (Trk)
- TrackTruthCollection_p2::Entry (Trk)
- TrackTruthCollection_p1::Entry (Trk)
- Entry (generateMioctEncodingFile)
- EntryLayerFilter (ISF)
- EntryLayerTool (ISF)
- EnumDictLoader (egammaEventDict)
- EnumDictLoader (tauEventDict)
- Enumerate (python.utils.AtrunQueryUtils)
- EnumSize (ana)
- EnumSize< ObjectType > (ana)
- EnumSize< SelectionChoice > (ana)
- EnumSize< SelectionStep > (ana)
- Envelope
- BeamPipeDetectorFactory:EnvelopeEntry
- BeamPipeDetectorFactory:EnvelopeShapes
- EnvelopeTool
- EOS (python.DiskUtils)
- EOSDataset (datasets)
- Epos
- Eq (RealArg)
- EqOfMotionFactory (FADS)
- EqOfMotionFactoryBase (FADS)

https://atlas-sw-doxygen.web.cern.ch/atlas-sw-doxygen/atlas_22.0.X-DOX/docs/html/classes.html

- ▶ Doxygen-compatible comments start like:

```

/*                               ///
 * ... text ...                 /// ... text ...
 */                               ///

```

```

/*!                              //!
 ... text ...                    //! ... text ...
 */                              //!

```

- ▶ In-there: different commands for annotation
 commands start with **@** or ****(please use **@**)
- ▶ Documentation block comes **before** method or class

Commands of every class should have:

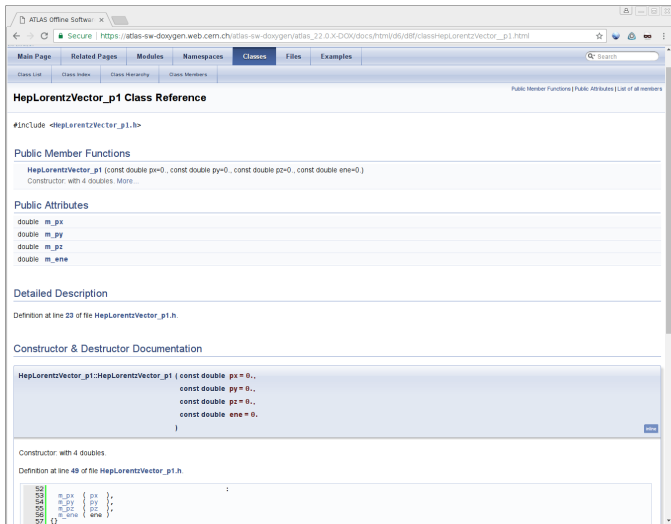
- ▶ **@author** – include email address & institute
 @author Alexey Boldyrev <alexey.boldyrev@cern.ch>
- ▶ **@date**
 @date Dec 11 2017
- ▶ **@brief** – one-liner about following method or class
 @brief A very important class
- ▶ **@details** – extensive documentation of following method or class
 @details I'm going to talk about what is going here
- ▶ **@class** – first item; name of class
 @class AthAlgTool

More about @details:

- ▶ @details for extensive documentation and explanation of method or class
- ▶ Place for references, examples, equations
- ▶ Doxygen allows to use HTML, Markdown, LaTeX for text styling (not only in @details section, but especially)
- ▶ Markdown:
 - ▶ *italic*, **bold**, [link](<http://cern.ch/>)
 - ▶ # Heading 1; ## Heading 2; ...
 - ▶ * List item 1; * List item 2; ...
- ▶ LaTeX:
 - ▶ Inline: @f\$ \LaTeX @f\$
 - ▶ Block: @f[\LaTeX @f]

- ▶ For classes and methods:
 - ▶ **@version** – only if you intend to keep it up to date (in special cases when you need to refer to given code version at GitLab)
 - ▶ **@note**, **@attention**, **@remark**, **@warning**, **@todo** – ways to steer reader's/own attention to something
 - ▶ **@namespace** – Use namespaces sparingly (follow ATLAS coding conventions)
 - ▶ **@name**, **@{** and **@}** – generate member block with name

- ▶ For methods and functions:
 - ▶ **@param** – explanation of every parameter of method call
@param lngth The lenght in cm
 - ▶ **@return** – like @param but for returned parameter
@return A std::vector of vectors



The screenshot shows a web browser window displaying the Doxygen documentation for the `HepLorentzVector_p1` class. The browser's address bar shows the URL: `https://atlas-sw-doxygen.web.cern.ch/atlas-sw-doxygen/atlas_22.0.X-DOX/docs/html/d6/d8f/classHepLorentzVector_p1.html`. The navigation tabs include Main Page, Related Pages, Modules, Namespaces, Classes, Files, and Examples. The current page is titled "HepLorentzVector_p1 Class Reference".

The documentation content includes:

- #Include**: `<HepLorentzVector_p1.h>`
- Public Member Functions**:
 - `HepLorentzVector_p1 (const double px=0., const double py=0., const double pz=0., const double ene=0.)`
Constructor with 4 doubles. More...
- Public Attributes**:
 - `double m_px`
 - `double m_py`
 - `double m_pz`
 - `double m_ene`
- Detailed Description**: Definition at line 23 of file `HepLorentzVector_p1.h`.
- Constructor & Destructor Documentation**:


```
HepLorentzVector_p1::HepLorentzVector_p1 ( const double px = 0.,
                                         const double py = 0.,
                                         const double pz = 0.,
                                         const double ene = 0.
                                         )
```

Constructor with 4 doubles.
Definition at line 49 of file `HepLorentzVector_p1.h`.

```

18  m_px { px }
19  m_py { py }
20  m_pz { pz }
21  m_ene { ene }

```

Technical information:

- ▶ Documentation of entire Athena is **updated every day** around 06:00
- ▶ Doxygen version in use: 1.8.11
- ▶ Doxygen is maintained by ATLAS Documentation team

- ▶ ATLAS Offline Software
is reasonably well documented with Doxygen
- ▶ Please use Doxygen in your code!
- ▶ Futher reading:
 - ▶ [ATLAS Offline Software documentation](#)
 - ▶ [Doxygen manual](#)
 - ▶ [Doxygen @GitHub](#)