



## ATLAS Note

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# Guide to references and BibT<sub>E</sub>X in ATLAS documents

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This document discusses how to use BibT<sub>E</sub>X for the bibliography of your ATLAS paper. It covers what to pay attention to when creating references and how to get round common problems. Standard `.bib` bibliography files are provided which contain all ATLAS and CMS journal publications as well as ATLAS CONF and PUB notes.

Use of both `biblatex` and the more traditional BibT<sub>E</sub>X for formatting the references is covered. A `biblatex` style file and two BibT<sub>E</sub>X (`.bst`) style files have been created that can be used with any of the ATLAS supported journals, depending on whether they require the title of the references to be included or not.

This document was generated using version 05-02-00 of the ATLAS L<sup>A</sup>T<sub>E</sub>X package. The T<sub>E</sub>X Live version is set to 2016. It uses the option `atlasstyle`, which implies that the standard ATLAS preprint style is used.

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## 1 Introduction

The ATLAS Collaboration has specific guidelines as to what constitutes a good bibliographic style. For example, a reference to a paper by an LHC Collaboration must not include the first author, whereas, if the paper is by any other collaboration it should. Where available, links to the arXiv entries of the papers should be included. To help authors with their paper preparations, a standard ATLAS bibliographic style has been developed which incorporates all of these requirements, and, at the same time, is largely compatible with those of the journals the papers are being submitted to.

It is strongly recommended to use BibT<sub>E</sub>X for the references. Although it often appears harder to use at the beginning, it means that the number of typos should be reduced significantly and the format of the references will be correct, without you having to worry about formatting it. In addition the order of the references is automatically correct. Files which contain ATLAS and CMS journal publications as well as ATLAS CONF and PUB notes in BibT<sub>E</sub>X format are provided – see Section 2.1.

A new implementation of BibT<sub>E</sub>X is provided by the biblatex [1] package. All ATLAS documents use this package now by default. One major advantage of the package is that it defines quite a few more entry types that are much more suitable for online documents and things like CONF and PUB notes. Adjustment of the style is also much simpler. It is possible to take a base style and then just apply changes to it rather than having to learn the details of how bst files are constructed.

The nomenclature is rather confusing as the package biblatex can use either biber or bibtex as a backend to process your .bib files. There are 3 possible cases that will be considered here:

1. biblatex + biber;

2. `biblatex + bibtex`;
3. Traditional Bib<sub>T</sub><sub>E</sub>X with `bibtex`;

As of Version 04-00-00 of `atlaslatex`, 1. is the default for ATLAS. You can change to the `bibtex` backend (alternative 2.) by passing the option `backend=bibtex` to `atlaspackage`. However, see Section 2.4 for some of the drawbacks of the `bibtex` backend. While the use of traditional Bib<sub>T</sub><sub>E</sub>X (alternative 3.) is deprecated, the templates indicate via commented out commands how to use it. If you use the `biber` backend, it is also possible to use UTF-8 encoding in the entries, which means that letters such as ä, é, ß can be included directly in the text.

The typical compilation cycle when using `biblatex` with the `bibtex` backend or the traditional version of Bib<sub>T</sub><sub>E</sub>X looks like the following:

```
pdflatex mydocument
biber mydocument
pdflatex mydocument
pdflatex mydocument
```

If you use `biblatex` with the backend `bibtex` rather than `biber`, replace the command `biber` with `bibtex`.

`biber` and `bibtex` create a file with the extension `.bbl`, which contains the actual references used, and (pdf)L<sub>A</sub>T<sub>E</sub>X then takes care to include them in your document. Note that only after the third run of pdfL<sub>A</sub>T<sub>E</sub>X will all references be correct. Unless you change a reference you do not have to do the `biber`/`bibtex` step again. The style of the references is governed by the `biblatex` options that you use or the Bib<sub>T</sub><sub>E</sub>X style file (which has the extension `bst`).

You can of course use L<sub>A</sub>T<sub>E</sub>X rather than pdfL<sub>A</sub>T<sub>E</sub>X, but pdfL<sub>A</sub>T<sub>E</sub>X is preferred, as things like clicking on cross-references and links to publications in the bibliography work much more reliably with pdfL<sub>A</sub>T<sub>E</sub>X.

## 2 Bibliography databases

One or more files with the extension `.bib` should contain all the references. The files may also contain references that you do not use, so they act like a library of references. See Section 2.1 for details on files which contain ATLAS and CMS journal publications as well as ATLAS CONF and PUB notes.

You should check that you base your `.bib` file on the examples provided, as they have the references in the style recommended for ATLAS publications. This will definitely save time in the reviewing process!

If you use `biblatex`, you should include commands like:

```
\addbibresource{bib/ATLAS.bib}
\addbibresource{bib/CMS.bib}
\addbibresource{atlas_biblatex.bib}
```

in the preamble of your document.

If you use traditional Bib<sub>T</sub><sub>E</sub>X you include the source file(s) at the place where the bibliography should be printed as follows:

```
{\raggedright
  \bibliography{bib/ATLAS,%
    bib/CMS.bib,%
    atlas_biblatex}
}
```

If you use `atlaspackage`, then `biblatex` is used with the `biber` backend by default. Turn off the use with the option `biblatex=false`.

If you want to use the `bibtex` backend, include `atlaspackage` with the option `backend=bibtex` and use the command `bibtex` instead of `biber` to process the `.bib` files. Note that `biber` returns an error if it encounters an empty `.bib` file.

## 2.1 Databases with ATLAS and CMS references

Four database files with all ATLAS and CMS journal references as well as ATLAS CONF and PUB notes are provided:

**ATLAS.bib** the citation key is the ATLAS reference code, e.g. HIGG-2012-27;

**CMS.bib** the citation key is the CMS reference code, e.g. CMS-HIG-12-036;

**ConfNotes.bib** the citation key is the CONF note number, e.g. ATLAS-CONF-2014-063;

**PubNotes.bib** the citation key is the PUB note number, e.g. ATL-PHYS-PUB-2014-021.

These are available in the directory `bib` of `atlaslatex`. The files are updated once per month and all entries have been checked for correct formatting. These files are included whenever a new version of `atlaslatex` is released. They are also available directly from the PubCom TWiki [2]. You are strongly encouraged to use these files and not try to maintain your own copies of such publications.

As of Version 01-07-02 of `atlaslatex`, ATLAS journal publications, CONF and PUB notes as well as CMS publications are available.

## 2.2 References from Inspire

A common way to find a reference is using Inspire [3]. You can select the output format as BibTeX and simply copy the result(s) to your `.bib` file. In order that the reference follows the ATLAS conventions you need to do the following, assuming that the reference is for an LHC collaboration paper:

1. Change the field name `author` to `xauthor`.
2. Change the field name `collaboration` to `author` and write the collaboration in the form `"{ATLAS Collaboration}"`. Note the use of both quotes and curly braces.
3. Either replace the journal name with the appropriate macro, e.g. `"Phys.Lett."` with `"\PLB"`; or insert spaces between the parts of the name, i.e. `"Phys. Lett."`.
4. Remove the journal letter from the volume and include it in the journal, e.g. `"Eur. Phys. J. C "`, `"Phys. Rev. D "`.

If the reference is for another collaboration, rename the `collaboration` field to `xcollaboration` and insert `{NonLHC Collaboration}` and at the beginning of the author field.

Instead of renaming the `author` or `collaboration` fields, you can of course simply delete them! Do not comment the lines out, as comment lines are not recognised inside Bib<sub>T</sub><sub>E</sub>X entries.

## 2.3 Entry types to use

Sometimes it is not clear what entry type to use. Here are a few guidelines. Note that some of the entry types that `biblatex` has are not part of Bib<sub>T</sub><sub>E</sub>X.

**@article** This is easy – use it for articles published in journals, e.g. [4].

**@book** Just as easy – use it for books, e.g. [5].

**@proceedings, @inproceedings** The name says it all. Use `@inproceedings` for a paper in the proceedings and `@proceedings` for the whole volume.

**@collection** Use it for things such as the ATLAS Technical Design Report [6] where the names that you find are the editors. Use `@incollection` for a single article in a collection. If you use traditional Bib<sub>T</sub><sub>E</sub>X, you have to use `@booklet` as in Ref. [7].

**@report** Use it for conference and internal notes. This is probably also the best type to use for preprints if you use `biblatex`. You can also use `@booklet` or `@online` instead.

**@online** Use it for things that are only available online, e.g. [8]. If you use traditional Bib<sub>T</sub><sub>E</sub>X you have to use `@misc` instead.

**@thesis** The name says it all. `@phdthesis` and `@mastersthesis` also exist. If you are using `biblatex` you can and should specify the thesis type, e.g. `type = {PhD}`, see for example a PhD thesis [9].

`biblatex` also knows about multivolume proceedings etc. See the manual for more details.

## 2.4 Errata

As of Version 04-00-00 of `atlaslaex` Errata for ATLAS publications are included. `biblatex` offers a nice mechanism for this using the `related` field. For example, Ref [10] has an Erratum. This is achieved using the following:

```
@Article{EXOT-2013-13,
  author      = "{ATLAS Collaboration}",
  title       = "{Search for new phenomena in final states ...}",
  journal     = "Eur. Phys. J. C",
  volume      = "75",
  year        = "2015",
  pages       = "299",
  doi         = "10.1140/epjc/s10052-015-3517-3",
  reportNumber = "CERN-PH-EP-2014-299",
  eprint      = "1502.01518",
```

```

archivePrefix = "arXiv",
primaryClass  = "hep-ex",
related       = "EXOT-2013-13-err",
relatedstring = "Erratum:",
}

@Article{EXOT-2013-13-err,
author      = "{ATLAS Collaboration}",
journal     = "Eur. Phys. J. C",
volume      = "75",
year        = "2015",
pages       = "408",
doi         = "10.1140/epjc/s10052-015-3639-7",
reportNumber = "CERN-PH-EP-2014-299",
}

```

This mechanism is used in `ATLAS.bib` and will be extended to `CMS.bib` once I have a list of the CMS Errata.

The mechanism only works if the `biber` backend is used. Using the standard files with the `bibtex` backend and/or traditional `BibTeX` does not cause errors when compiling. However, the Errata are simply ignored. Instead, you also should use the files `ATLAS-errata.bib` etc. (with the appropriate key, e.g. `EXOT-2013-13-witherratum` [11]). An example entry looks like:

```

@Article{EXOT-2013-13-witherratum,
author      = "{ATLAS Collaboration}",
title       = "{Search for new phenomena in final states ...}",
journal     = "Eur. Phys. J. C",
volume      = "75",
year        = "2015",
pages       = "299",
doi         = "10.1140/epjc/s10052-015-3517-3",
reportNumber = "CERN-PH-EP-2014-299",
eprint      = "1502.01518",
archivePrefix = "arXiv",
primaryClass = "hep-ex",
addendum    = "Erratum: \href{http://dx.doi.org/10.1140/epjc/s10052-015-3639-7}{Eur. Phys. J. C} ",
}

```

With traditional `BibTeX`, you have to replace the field name “addendum” with “note”, as the “addendum” field was introduced with `biblatex`.

### 3 Examples

The examples given above and in this section can be found in the file `doc/atlas_bibtex/atlas_bibtex.bib` of `atlaslatex`. Here are some typical reference types needed in ATLAS documents:

- LHC Collaboration [4]
- Other collaboration [12]
- Individual authors [13]
- arXiv only [14]
- arXiv only submitted to a journal [15]
- ATLAS CONF Note [16]

While the `collaboration` field is a nice idea, it is not supported by many Bib<sub>T</sub><sub>E</sub>X styles. Hence in Ref. [4], `collaboration` has been renamed to `author` and the `author` field has been renamed as `xauthor`. If you use `collaboration` and omit `author` you will get a warning when you run `bibtex`.

Note that in Ref. [16] the entry type `@article` used to be used and the field `journal` was abused for the conference note number. This is a result of the traditional Bib<sub>T</sub><sub>E</sub>X restrictions on the entry types. The current version uses `@booklet` and includes the CONF note number via the `howpublished` field. In general, `biblatex` provides a lot more entry types. This is one of the reasons for the move to `biblatex` as the default for the ATLAS templates. All `atlaslatex` documentation uses `biblatex` with the backend `biber`. As of Version 04-00-00 of `atlaslatex`, this is also the default for ATLAS documents.

For papers that have been submitted to a journal, but not yet published, use the entry type `@article`. You should specify the journal in the `journal` field in form:

```
journal = "submitted to \PLB{" or
journal = "accepted by \PLB{".
```

### 3.1 Bibliography database tips

- A bibliographic item is created in the `.bib` file as:

```
@article{lhCollaboration:2012,
  author = "...",
  title = "...",
  further bibliographic information}
}
```

The identifier directly after the document type declaration is how one should refer to this item inside the main `.tex` file. Use a non-breaking space between the citation and the reference, i.e. `... measured previously~\cite{lhCollaboration:2012}`.

- When referencing ATLAS CONF notes, the URL to the CDS page should be included. For this to work, in the preamble of your `.tex` document add `\usepackage{hyperref}`. Note that `hyperref` is included by default if you use `atlasdoc` and/or `atlaspackage`.
- Depending on the style that is used, if the DOI is filled and the `hyperref` package loaded, the title of the journal can be highlighted in blue and become a hyperlink to the online paper.

- When referencing papers from journals like PRD, PLB, etc., one has to be careful not to include the “D” or “B” as part of the volume. Instead these belong to the journal name. You can either use the macros that have been added to the .bst style files for these journals, or the macros defined in atlasjournal. If you want to use biblatex or other bst files, it is probably better to use the atlasjournal definitions.
- See the Section 2.4 on Errata for hints on how best to include Errata.
- Comments are not part of the bibliography database format. Text outside entries will be ignored. Do not try to comment out fields inside an entry! If there are fields that you do not want, you have to move them outside the entry.

In earlier versions of this document, it was recommended to include the cite package, if you use BibTeX and want to cite multiple references in the format [m-n]. However, the journal style files can do this for you by using the option sort&compress option if natbib is used. The revtex style also does this for you. If you use biblatex use the option style=numeric-comp, which is the default in atlaslatex.

## 4 ATLAS bibliography style

The format of the references in your ATLAS paper depends on the journal to which you are submitting, but in general we can classify the journal styles in two categories: those which require the title of the references and those which do not. To ensure the homogeneity in all ATLAS publications, biblatex and BibTeX style files are provided for each of these categories along with an example file that illustrates how different types of bibliographic material should be referenced.

The biblatex style settings can be found in the directory latex, while the traditional BibTeX style files can be found in the directory bib/bst of the atlaslatex package.

For the final version of ATLAS notes, both internal and public, a style without the title for papers in journals is recommended. For draft versions, it is good to include the title, as it is then clearer what the reference refers to.

### 4.1 biblatex style file

If you use biblatex the basic options are set in latex/atlaspackage.sty. A few adjustments are made in the style file latex/atlasbiblatex.sty, which you should include with a normal \usepackage command. By default, this style includes the document title. The title can be turned off by including the option articletitle=false. This option turns off the title for entry types @article, @booklet and @report, as @booklet should be used as the entry type for CONF and PUB notes. A summary of the options is:

**block=ragged** specify the option for extra spacing between blocks when making the bibliography with biblatex. ragged uses \raggedright, but tries not to break titles across lines; none and space print the references in block mode, while space includes an extra space between the author and title; The default option (ragged) tries to fit the title into a single line and so sometimes leads to a new line starting immediately after the author.

**maxbibnames=5** specify the maximum number of author names before “et al.” is used, where the value is an integer;



**articletitle=true|false** turn on or off including the article title in the bibliography;

**titlequote=true|false** enclose the title in quotes instead of emphasize;

**showdoi=true|false** make the journal reference a link to the DOI instead of displaying it;

**eprint=true|false** print the arXiv reference if available.

**address=true|false** turn on or off the printing of the address field.

**location=true|false** turn on or off the printing of the location field.

**texlive=YYYY** set if you use an older version of T<sub>E</sub>X Live like 2009. This option is usually set in the document class.

With `biblatex`, notes are printed after the journal reference and before the arXiv or URL. If you want the note to be printed after the arXiv or URL, use the `addendum` rather than the `note` field. The `addendum` field is ignored by traditional BibT<sub>E</sub>X. The field `address` is an alias for `location` in `biblatex`. The `month` field is ignored when using `biblatex`.

To print the bibliography include the command:

```
\printbibliography
```

where it should get printed.

## 4.2 Traditional BibT<sub>E</sub>X style files

If you use traditional BibT<sub>E</sub>X, you should choose between the two style files given below, depending on the journal to which they wish to submit their paper. These style files have been successfully tested in the framework provided by the journals listed in the following sections and with the standard ATLAS document template.

Note that use of traditional BibT<sub>E</sub>X style files is deprecated and not all options provided for `biblatex` have been ported to the BibT<sub>E</sub>X style files.

### 4.2.1 BibT<sub>E</sub>X style file for journals with the title in the reference

BibT<sub>E</sub>X style file: `atlasBibStyleWithTitle.bst`. Journals:

- JHEP
- JINST
- NJP

Include at the end of your `.tex` file the following lines:

```
\bibliographystyle{bib/bst/atlasBibStyleWithTitle}  
\bibliography{atlas-bibtex}
```

You can use the Bib<sub>T</sub><sub>E</sub>X style `JHEP.bst` for papers that are supposed to be submitted to JHEP. However, note that JHEP only prints the arXiv entry etc. if the entry type is `@article`. In the examples included in this document, the entry type `@booklet` is used for preprints and CONF notes, as this works best with other Bib<sub>T</sub><sub>E</sub>X styles. If you are planning to submit to JHEP/JINST and use `JHEP.bst` replace all `@booklet` entry types with `@article`.

#### 4.2.2 Bib<sub>T</sub><sub>E</sub>X style file for journals without the title in the reference

Bib<sub>T</sub><sub>E</sub>X style file: `atlasBibStyleWoTitle.bst`. Journals:

- EPJC
- NPB
- PLB
- PRD
- PRL

Include at the end of your `.tex` file the following lines:

```
\bibliographystyle{bib/bst/atlasBibStyleWoTitle}
\bibliography{atlas-bibtex}
```

## 5 Journal names

It is often the case that one sees several different abbreviations for journal names in one set of references. In order to try to get round this problem, macros are defined that contain the standard abbreviations. It is then also possible to modify the abbreviation if a journal uses a different convention from ours.

The abbreviations can be found in the style file `latex/atlasjournal.sty`, which is included by default if you load `atlasphysics`. If you use traditional Bib<sub>T</sub><sub>E</sub>X, you should give the journal name in the form `journal = "\PLB{ }"`,. If you use `biblatex` the form `journal = "\PLB"`, works without problems. This style file also defines several other abbreviations that can be adjusted to the journal style. Standard sets for different journals can be provided by an option in the future.

## 6 Extracting used database entries

At some point you may want to create a bibliography database that only contains the references you are actually using in a document. You can do this using the `bibttool` program. Giving the command:

```
bibttool -x mydocument.aux -o refs.bib
```

will extract the entries that you use and in future you can use and correct `refs.bib`, which only contains the references that you actually cite.<sup>1</sup>

For Debian/Ubuntu distributions you should be able to install `bibtool` by giving the command `(sudo) apt-get install bibtool`. For RPM-based Linux (CentOS, Scientific Linux, Fedora, ...) distributions the equivalent command is `yum install BibTool`. On a Mac, you can install it via MacPorts: `(sudo) port install BibTool`, or via Homebrew: `brew install bib-tool`.

## History

**2013-08-13: Cristina Oropenza Barrera** First version of the document released.

**2014-08-14: Ian Brock** Updated the example references a bit and gave a bit more background information.

**2014-12-03: Ian Brock** Text taken from paper template and merged into this document. Document adjusted for use of `biblatex` as the default.

**2015-01-30: Ian Brock** Try to clarify the nomenclature and the recommended way to use `BibTeX`.

**2015-03-20: Ian Brock** Add information about standard ATLAS and CMS bibliography databases.

**2016-06-14: Ian Brock** Add information about address and location options.

**2016-07-08: Ian Brock** Add some advice on entry types to use. Reorganise a bit.

**2017-02-14: Ian Brock** Move options block and `maxbibnames` to `atlasbiblatex`.

**2017-06-01: Ian Brock** Adjust documentation to reflect change of directories for `bib` and `bst` files.

**2017-07-19: Ian Brock** Switch to `biber` as the default `biblatex` backend. Added documentation on how to include Errata.

## References

- [1] *biblatex – Bibliographies in  $\LaTeX$  using `BibTeX` for sorting only*,  
URL: <http://www.ctan.org/pkg/biblatex>.
- [2] *Standard ATLAS and CMS references*,  
URL: <https://twiki.cern.ch/twiki/bin/view/AtlasProtected/PubComRefs>.
- [3] *INSPIRE, the High Energy Physics information system*, URL: <http://inspirehep.net>.
- [4] ATLAS Collaboration, *Searches for supersymmetry with the ATLAS detector using final states with two leptons and missing transverse momentum in  $\sqrt{s} = 7$  TeV proton–proton collisions*, *Phys. Lett. B* **709** (2012) 137, arXiv: [1110.6189](https://arxiv.org/abs/1110.6189) [[hep-ex](#)].
- [5] H. Kopka and P. W. Daly, *Guide to  $\LaTeX$* , 4th ed., Addison-Wesley, 2004.

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<sup>1</sup> I got this tip from <http://tex.stackexchange.com/questions/417/how-to-split-all-bibtex-referenced-entries-from-a-big-bibtex-database-to-a-copy>. Do not forget to change `mydocument.tex`, or whatever your main filename is, to use `refs.bib` instead of the previous sources.

- [6] O. S. Brüning et al., eds., *LHC Design Report. 1. The LHC Main Ring*, CERN-2004-003-V-1, CERN-2004-003, 2004,  
URL: <https://cdsweb.cern.ch/record/782076>.
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- [8] T. Oetiker et al., *A (Not So) Short Introduction to LaTeX2e*,  
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- [9] T. Loddenkötter, “Implementation of a kinematic fit of single top-quark production in association with a  $W$  boson and its application in a neural-network-based analysis in ATLAS”, BONN-IR-2012-06, PhD Thesis: University of Bonn, 2012,  
URL: [http://hss.ulb.uni-bonn.de/diss\\_online](http://hss.ulb.uni-bonn.de/diss_online).
- [10] ATLAS Collaboration, *Search for new phenomena in final states with an energetic jet and large missing transverse momentum in  $pp$  collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector*, *Eur. Phys. J. C* **75** (2015) 299, arXiv: [1502.01518 \[hep-ex\]](#),  
Erratum: *Eur. Phys. J. C* **75** (2015) 408.
- [11] ATLAS Collaboration, *Search for new phenomena in final states with an energetic jet and large missing transverse momentum in  $pp$  collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector*, *Eur. Phys. J. C* **75** (2015) 299, arXiv: [1502.01518 \[hep-ex\]](#),  
Erratum: *Eur. Phys. J. C* **75** (2015) 408.
- [12] PHOBOS Collaboration, B. Alver et al., *Cluster properties from two-particle angular correlations in  $pp$  collisions at  $\sqrt{s} = 200$  GeV and 410 GeV*, *Phys. Rev. C* **75** (2007) 054913,  
arXiv: [0704.0966 \[hep-ex\]](#).
- [13] A. Sherstnev and R. S. Thorne, *Parton distributions for LO generators*, *Eur. Phys. J. C* **55** (2008) 553, arXiv: [0711.2473 \[hep-ph\]](#).
- [14] P. Z. Skands, *The Perugia tunes*, 2009, arXiv: [0905.3418 \[hep-ph\]](#).
- [15] J. Monk and C. Oropeza-Barrera, *The HBOM method for unfolding detector effects*, submitted to Nucl. Instrum. Meth. (2011), arXiv: [1111.4869 \[hep-ex\]](#).
- [16] ATLAS Collaboration, *Search for gluino-mediated scalar top and bottom quark production in final states with missing transverse energy and at least three  $b$ -jets with the ATLAS Detector*, ATLAS-CONF-2012-058, 2012, URL: <http://cdsweb.cern.ch/record/1453786>.