ATLAS NOTE

28th June 2016

Symbols defined in `atlasphysics.sty`

Ian C. Brock

University of Bonn

Abstract

This note lists the symbols defined in `atlasphysics.sty`. These provide examples of how to define your own symbols, as well as many symbols that are often used in ATLAS documents.

This document was generated using version 01-08-00 of the ATLAS LaTeX package. The TeX Live version is set to 2013. It uses the option atlasstyle, which implies that the standard ATLAS preprint style is used.

Contents

1 atlasphysics.sty style file 2

2 atlasparticle.sty 4

3 atlasjournal.sty 5

4 atlasmisc.sty 6

5 atlasxref.sty 8

6 atlasbsm.sty 8

7 atlasheavyion.sty 9

8 atlasjetetmiss.sty 10

9 atlasmath.sty 14

10 atlasother.sty 14

11 atlasprocess.sty 15

12 atlasunit.sty 16

13 Changes 17

14 Old macros 17

1 atlasphysics.sty style file

The `atlasphysics.sty` style file implements a series of useful shortcuts to typeset a physics paper, such as particle symbols.

Options are parsed with the `kvoptions` package, which is included by default. The style file can included in the preamble of your paper with the usual syntax:

```
\usepackage{\ATLASLATEXPATH atlasphysics}
```

As of version 01-00-00 the file is actually split into smaller files, which can be included or not using options. The following options are available, where the default setting is given in parentheses:

BSM (false) BSM and SUSY particles.

hion (false) Useful macros for heavy ion physics.

jetetmiss (false) Useful macros for Jet/ETmiss publications.

journal (true) Journal abbreviations and a few other definitions for references.

math (false) A few extra maths definitions.

misc (true) Miscellaneous definitions that are often used.

other (false) Definitions that used to be in `atlasphysics.sty`, but are probably too specialised to be needed by most people.

particle (true) Standard Model particles and some combinations.

process (false) Some example processes. These are not included by default as the current choice is rather arbitrary and certainly not complete.

unit (true) Units that used to be defined – not needed if you use `siunitx` or `hepunits`.

xref (true) Useful abbreviations for cross-references.

texlive=YYYY (2013) Set if you use an older version of TeX Live like 2009.

texmf Use the syntax `\usepackage{package}` instead of `\usepackage{\ATLASLATEXPATH package}` to include packages. This is needed if you install `atlaslatex` centrally, rather than in a `latex` subdirectory.

Note that BSM and BSM=true are equivalent. Use the syntax option=false to turn off an option.

If the option texmf is included, the subfiles are included using the command: `\RequirePackage{atlasparticle}` etc. instead of `\RequirePackage{\ATLASLATEXPATH atlasparticle}`. This is useful if you install the ATLAS LaTeX package in a central directory such as `${HOME}/texmf/tex/latex`.

All definitions are done in a consistent way using `\newcommand*`. All definitions use `\ensuremath` where appropriate and are terminated with `\xspace`, so you can simply write `\ttbar production` instead of `\ttbar\ production` or `\ttbar{} production` to get '$t\bar{t}$ production'.

The `hepparticles` [1] package has uniform definitions for many Standard Model and BSM particles. In fact you should use the package `heppennames` and/or `hepnicenames`, which contain many predefined particles. These packages load `hepparticles`, which can then be used to define more particles if you need them. One very nice feature of these packages is that you can switch between italic and upright symbols via an option.

See Sect. 14 for details on changes that were introduced when when going from version 00-04-05 of `atlasnote` to version 01-00-00 of `atlaslatex`. Let me know if you spot some other changes that are not documented here!

Changes to the contents that might affect existing documents are given in Sect. 13.

The following sections list the macros defined in the various files.

2 atlasparticle.sty

Turn on including these definitions with the option particle=true and off with the option particle=false.

As an alternative you can use the hepparticles [1] package, which has uniform definitions for many Standard Model and BSM particles. In practice you should use the package heppennames and/or hepnicenames, which contain many predefined particles. These packages load hepparticles, which can then be used to define more particles if you need them. One very nice feature of these packages is that you can switch between italic and upright symbols via an option.

\pp	pp
\tbar	$\bar{t}$
\ttbar	$t\bar{t}$
\bbbar	$b\bar{b}$
\cbar	$\bar{c}$
\ccbar	$c\bar{c}$
\sbar	$\bar{s}$
\ssbar	$s\bar{s}$
\ubar	$\bar{u}$
\uubar	$u\bar{u}$
\dbar	$\bar{d}$
\ddbar	$d\bar{d}$
\fbar	$\bar{f}$
\ffbar	$f\bar{f}$
\qbar	$\bar{q}$
\qqbar	$q\bar{q}$
\nbar	$\bar{\nu}$
\nnbar	$\nu\bar{\nu}$
\pbar	$\bar{p}$
\ppbar	$p\bar{p}$
\ee	e^+e^-
\epm	$e^\pm$
\epem	e^+e^-
\mumu	$\mu^+\mu^-$
\tautau	$\tau^+\tau^-$
\leplep	$\ell^+\ell^-$
\ellell	$\ell^+\ell^-$
\enu	$e\nu$
\munu	$\mu\nu$
\lnu	$\ell\nu$
\Zzero	Z
\Zboson	Z
\Wplus	W^+
\Wminus	W^-
\Wboson	W
\Wpm	$W^\pm$
\Wmp	$W^\mp$
\pi	π
\pizero	π^0
\piplus	π^+
\piminus	π^-
\pipm	$\pi^\pm$
\pimp	$\pi^\mp$
\eta	η
\etaprime	η'
\Kzero	K^0
\Kzerobar	$\overline{K}^0$
\kaon	K
\Kplus	K^+
\Kminus	K^-
\KzeroL	K^0_L
\Kzerol	K^0_L
\Klong	K^0_L
\KzeroS	K^0_S
\Kzeros	K^0_S
\Kshort	K^0_S
\Kstar	K^*
\psi	ψ
\jpsi	J/ψ
\Jpsi	J/ψ
\psip	ψ'
\Upsp	Υ'

\Upspp	Υ''
\Upsppp	Υ'''
\Upspppp	Υ''''
\UoneS	$\Upsilon(1S)$
\Dstar	D^*
\Dsstar	D^{**}
\Bd	B_d^0
\Bs	B_s^0
\Bu	B_u
\Bc	B_c
\Lb	Λ_b
\Bstar	B^*
\chic	χ_c
\BoBo	B^0–$\bar{B}^0$
\BodBod	B_d^0–$\bar{B}_d^0$
\BosBos	B_s^0–$\bar{B}_s^0$
\chib	χ_b

A generic macro `\Ups[1]` is available. It is defined such that `\Ups{3}` produces $\Upsilon(3S)$.

3 atlasjournal.sty

Turn on including these definitions with the option journal=true and off with the option journal=false.

\AcPA	Acta Phys. Austriaca
\ARevNS	Ann. Rev. Nucl. Sci.
\CPC	Comp. Phys. Comm.
\FortP	Fortschr. Phys.
\IJMP	Int. J. Mod. Phys.
\JETP	Sov. Phys. JETP
\JETPL	JETP Lett.
\JaFi	Jad. Fiz.
\JMP	J. Math. Phys.
\MPL	Mod. Phys. Lett.
\NCim	Nuovo Cimento
\NIM	Nucl. Instrum. Meth.
\NP	Nucl. Phys.
\NPB	Nucl. Phys. B
\PL	Phys. Lett.
\PLB	Phys. Lett. B
\PR	Phys. Rev.
\PRC	Phys. Rev. C
\PRD	Phys. Rev. D
\PRL	Phys. Rev. Lett.
\PRep	Phys. Rep.
\RMP	Rev. Mod. Phys.
\ZfP	Z. Phys.
\EPJ	Eur. Phys. J.
\EPJC	Eur. Phys. J. C
\collab	Collaboration

4 atlasmisc.sty

Turn on including these definitions with the option misc=true and off with the option misc=false.

\pT	p_{T}
\pt	p_{T}
\ET	E_{T}
\eT	E_{T}
\et	E_{T}
\HT	H_{T}
\pTsq	p_{T}^{2}
\MET	$E_{\mathrm{T}}^{\mathrm{miss}}$
\met	$E_{\mathrm{T}}^{\mathrm{miss}}$
\sumET	$\sum E_{\mathrm{T}}$
\EjetRec	E_{rec}
\PjetRec	p_{rec}
\EjetTru	E_{truth}
\PjetTru	p_{truth}
\EjetDM	E_{DM}
\Rcone	R_{cone}
\abseta	$\|\eta\|$
\Ecm	E_{cm}
\rts	$\sqrt{s}$
\sqs	$\sqrt{s}$
\Nevt	N_{evt}
\zvtx	z_{vtx}
\dzero	d_0
\zzsth	$z_0 \sin(\theta)$
\RunOne	Run 1
\RunTwo	Run 2
\RunThr	Run 3
\kt	k_t
\antikt	anti-k_t
\Antikt	Anti-k_t
\btag	b-tagging
\btagged	b-tagged
\bquark	b-quark
\bquarks	b-quarks
\bjet	b-jet
\bjets	b-jets
\mh	m_h
\mW	m_W
\mZ	m_Z
\mH	m_H
\ACERMC	AcerMC
\ALPGEN	Alpgen
\GEANT	Geant
\Herwigpp	Herwig++
\HERWIGpp	Herwig++
\Herwig	Herwig
\HERWIG	Herwig
\JIMMY	Jimmy
\MADSPIN	MadSpin
\MADGRAPH	MadGraph
\MGMCatNLO	MadGraph5_aMC@NLO
\MCatNLO	MC@NLO
\AMCatNLO	aMC@NLO
\MCFM	MCFM
\METOP	MEtop
\POWHEG	Powheg
\POWHEGBOX	Powheg-Box
\POWPYTHIA	Powheg+Pythia
\PROTOS	Protos
\PYTHIA	Pythia
\SHERPA	Sherpa
\Comphep	CompHEP
\Perugia	Perugia
\Prospino	Prospino
\LO	LO
\NLO	NLO
\NLL	NLL
\NNLO	NNLO
\muF	μ_{F}
\muR	μ_{R}
\ra	$\rightarrow$

`\la`	$\leftarrow$
`\rarrow`	$\rightarrow$
`\larrow`	$\leftarrow$
`\lapprox`	$\lesssim$
`\rapprox`	$\gtrsim$
`\gam`	γ
`\stat`	(stat.)
`\syst`	(syst.)
`\radlength`	X_0
`\StoB`	S/B
`\alphas`	α_S
`\NF`	N_F
`\NC`	N_C
`\CF`	C_F
`\CA`	C_A
`\TF`	T_F
`\Lms`	$\Lambda_{\overline{\mathrm{MS}}}$
`\Lmsfive`	$\Lambda^{(5)}_{\overline{\mathrm{MS}}}$
`\KT`	$k_\perp$
`\Vcb`	$\lvert V_{cb}\rvert$
`\Vub`	$\lvert V_{ub}\rvert$
`\Vtd`	$\lvert V_{td}\rvert$
`\Vts`	$\lvert V_{ts}\rvert$
`\Vtb`	$\lvert V_{tb}\rvert$
`\Vcs`	$\lvert V_{cs}\rvert$
`\Vud`	$\lvert V_{ud}\rvert$
`\Vus`	$\lvert V_{us}\rvert$
`\Vcd`	$\lvert V_{cd}\rvert$

A length `\figwidth` is defined that is 2 cm smaller than `\textwidth`.

Most Monte Carlo generators also have a form with a suffix ‘V’ that allows you to include the version, e.g. `\PYTHIA{8}` to produce Pythia 8 or `\PYTHIA{8 (v8.160)}` to produce Pythia 8 (v8.160).

A generic macro `\twomass` is defined, so that for example `\twomass{\mu}{\mu}` produces $m_{\mu\mu}$ and `\twomass{\mu}{e}` produces $m_{\mu e}$.

A macro `\dk` is also defined which makes it easier to write down decay chains. For example

```
\[\eqalign{a \to & b+c\\
   & \dk & e+f \\
   && \dk g+h}
\]
```

produces

$$\begin{array}{lll} a \to b + c & & \\ & \lfloor\!\longrightarrow e + f & \\ & & \lfloor\!\longrightarrow g + h \end{array}$$

Note that `\eqalign` is also redefined in this package so that `\dk` works.

The following macro names have been changed: `\ptsq` → `\pTsq`.

5 atlasxref.sty

Turn on including these definitions with the option xref=true and off with the option xref=false.

The following macros with arguments are also defined:

\App{1}	App. 1
\Eqn{1}	Eq. 1
\Fig{1}	Fig. 1
\Ref{1}	Ref. 1
\Sect{1}	Sect. 1
\Tab{1}	Table 1
\Apps{1}{4}	Apps. 1 and 4
\Eqns{1}{4}	Eqs. 1 and 4
\Figs{1}{4}	Figs. 1 and 4
\Refs{1}{4}	Refs. 1 and 4
\Sects{1}{4}	Sects. 1 and 4
\Tabs{1}{4}	Tables 1 and 4
\Apprange{1}{4}	Apps. 1–4
\Eqnrange{1}{4}	Eqs. 1–4
\Figrange{1}{4}	Figs. 1–4
\Refrange{1}{4}	Refs. 1–4
\Sectrange{1}{4}	Sects. 1–4
\Tabrange{1}{4}	Tables 1–4

The idea is that you can adapt these definitions according to your own preferences (or those of a journal).

6 atlasbsm.sty

Turn on including these definitions with the option BSM and off with the option BSM=false.

The macro \susy simply puts a tilde (˜) over its argument, e.g. \susy{q} produces $\tilde{q}$.

For $\tilde{q}$, $\tilde{t}$, $\tilde{b}$, $\tilde{\ell}$, $\tilde{e}$, $\tilde{\mu}$ and $\tilde{\tau}$, L and R states are defined; for stop, sbottom and stau also the light (1) and heavy (2) states. There are four neutralinos and two charginos defined, the index number unfortunately needs to be written out completely. For the charginos the last letter(s) indicate(s) the charge: ‘p’ for +, ‘m’ for −, and ‘pm’ for ±.

\Azero	A^0
\hzero	h^0
\Hzero	H^0
\Hboson	H
\Hplus	H^+
\Hminus	H^-
\Hpm	$H^\pm$
\Hmp	$H^\mp$
\ggino	$\tilde{\chi}$
\chinop	$\tilde{\chi}^+$
\chinom	$\tilde{\chi}^-$
\chinopm	$\tilde{\chi}^\pm$
\chinomp	$\tilde{\chi}^\mp$
\chinoonep	$\tilde{\chi}_1^+$
\chinoonem	$\tilde{\chi}_1^-$
\chinoonepm	$\tilde{\chi}_1^\pm$
\chinotwop	$\tilde{\chi}_2^+$
\chinotwom	$\tilde{\chi}_2^-$
\chinotwopm	$\tilde{\chi}_2^\pm$
\nino	$\tilde{\chi}^0$
\ninoone	$\tilde{\chi}_1^0$
\ninotwo	$\tilde{\chi}_2^0$
\ninothree	$\tilde{\chi}_3^0$
\ninofour	$\tilde{\chi}_4^0$
\gravino	$\tilde{G}$

`\Zprime`	Z'
`\Zstar`	Z^*
`\squark`	$\tilde{q}$
`\squarkL`	$\tilde{q}_\mathrm{L}$
`\squarkR`	$\tilde{q}_\mathrm{R}$
`\gluino`	$\tilde{g}$
`\stop`	$\tilde{t}$
`\stopone`	$\tilde{t}_1$
`\stoptwo`	$\tilde{t}_2$
`\stopL`	$\tilde{t}_\mathrm{L}$
`\stopR`	$\tilde{t}_\mathrm{R}$
`\sbottom`	$\tilde{b}$
`\sbottomone`	$\tilde{b}_1$
`\sbottomtwo`	$\tilde{b}_2$
`\sbottomL`	$\tilde{b}_\mathrm{L}$
`\sbottomR`	$\tilde{b}_\mathrm{R}$
`\slepton`	$\tilde{\ell}$
`\sleptonL`	$\tilde{\ell}_\mathrm{L}$
`\sleptonR`	$\tilde{\ell}_\mathrm{R}$
`\sel`	$\tilde{e}$
`\selL`	$\tilde{e}_\mathrm{L}$
`\selR`	$\tilde{e}_\mathrm{R}$
`\smu`	$\tilde{\mu}$
`\smuL`	$\tilde{\mu}_\mathrm{L}$
`\smuR`	$\tilde{\mu}_\mathrm{R}$
`\stau`	$\tilde{\tau}$
`\stauL`	$\tilde{\tau}_\mathrm{L}$
`\stauR`	$\tilde{\tau}_\mathrm{R}$
`\stauone`	$\tilde{\tau}_1$
`\stautwo`	$\tilde{\tau}_2$
`\snu`	$\tilde{\nu}$

7 `atlasheavyion.sty`

Turn on including these definitions with the option hion=true and off with the option hion=false. The heavy ion definitions use the package `mhchem` to help with the formatting of chemical elements. This package is included by `atlasheavyion.sty`.

`\NucNuc`	A+A
`\nn`	nn
`\pn`	pn
`\np`	np
`\PbPb`	Pb+Pb
`\AuAu`	Au+Au
`\CuCu`	Cu+Cu
`\pNuc`	p+A
`\pdA`	p/d+A
`\dAu`	d+Au
`\pPb`	p+Pb
`\Npart`	N_part
`\avgNpart`	$\langle N_\mathrm{part}\rangle$
`\Ncoll`	N_coll
`\avgNcoll`	$\langle N_\mathrm{coll}\rangle$
`\TA`	T_A
`\avgTA`	$\langle T_\mathrm{A}\rangle$
`\TPb`	T_Pb
`\avgTPb`	$\langle T_\mathrm{Pb}\rangle$
`\TAA`	T_AA
`\avgTAA`	$\langle T_\mathrm{AA}\rangle$
`\TAB`	T_AB
`\avgTAB`	$\langle T_\mathrm{AB}\rangle$
`\TpPb`	$T_{p\mathrm{Pb}}$
`\avgTpPb`	$\langle T_{p\mathrm{Pb}}\rangle$
`\Gl`	Glauber
`\GG`	Glauber-Gribov
`\sqn`	$\sqrt{s_\mathrm{NN}}$
`\lns`	$\ln(\sqrt{s})$
`\sumETPb`	$\Sigma E_\mathrm{T}^\mathrm{Pb}$
`\sumETp`	ΣE_T^{p}

`\sumETA`	$\Sigma E_{\mathrm{T}}^{\mathrm{A}}$
`\RAA`	R_{AA}
`\RCP`	R_{CP}
`\RpA`	$R_{p\mathrm{A}}$
`\RpPb`	$R_{p\mathrm{Pb}}$
`\dif`	d
`\dNchdeta`	$\mathrm{d}N_{\mathrm{ch}}/\mathrm{d}\eta$
`\dNevtdET`	$\mathrm{d}N_{\mathrm{evt}}/\mathrm{d}E_{\mathrm{T}}$
`\ystar`	y^*
`\ycms`	y_{CM}
`\ygappb`	$\Delta\eta_{\mathrm{gap}}^{\mathrm{Pb}}$
`\ygapp`	$\Delta\eta_{\mathrm{gap}}^{p}$
`\fgap`	f_{gap}

8 atlasjetetmiss.sty

Turn on including these definitions with the option jetetmiss=true and off with the option jetetmiss=false.

`\topo`	topo-cluster
`\Topo`	Topo-cluster
`\topos`	topo-clusters
`\Topos`	Topo-clusters
`\pileup`	pile-up
`\Pileup`	Pile-up
`\insitu`	in-situ
`\Insitu`	In-situ
`\LS`	LS
`\NLOjet`	NLOJET++
`\Fastjet`	FASTJET
`\TwoToTwo`	$2 \to 2$
`\largeR`	large-R
`\LargeR`	Large-R
`\akt`	anti-k_t
`\Akt`	Anti-k_t
`\AKT`	anti-k_t
`\AKTFat`	anti-k_t , $R = 1.0$
`\AKTPrune`	anti-k_t , $R = 1.0$ (pruned)
`\AKTFilt`	anti-k_t , $R = 1.0$ (filtered)
`\KTSix`	k_t, $R = 0.6$
`\ca`	Cambridge-Aachen
`\CamKt`	C/A
`\CASix`	C/A, $R = 0.6$
`\CAFat`	C/A, $R = 1.2$
`\CAPrune`	C/A, $R = 1.2$ (pruned)
`\CAFilt`	C/A, $R = 1.2$ (filtered)
`\Rfilt`	R_{filt}
`\ymin`	y_{min}
`\fcut`	f_{cut}
`\Rsub`	R_{sub}
`\mufrac`	μ_{frac}

`\Rcut`	R_{cut}
`\zcut`	z_{cut}
`\ftile`	f_{Tile0}
`\fem`	f_{LAr3}
`\fpres`	f_{PS}
`\fhec`	f_{HEC0}
`\ffcal`	f_{FCal1}
`\central`	$0.3 \leq \lvert\eta\rvert < 0.8$
`\ecap`	$2.1 \leq \lvert\eta\rvert < 2.8$
`\forward`	$3.6 \leq \lvert\eta\rvert < 4.5$
`\Npv`	N_{PV}
`\Nref`	$N_{\mathrm{PV}}^{\mathrm{ref}}$
`\Navg`	$\langle N_{\mathrm{PV}} \rangle$
`\avgmu`	$\langle \mu \rangle$
`\JES`	JES
`\JMS`	JMS
`\EMJES`	EM+JES
`\GCWJES`	GCW+JES
`\LCWJES`	LCW+JES
`\EM`	EM
`\GCW`	GCW
`\LCW`	LCW
`\GSL`	GSL
`\GS`	GS
`\MTF`	MTF
`\MPF`	MPF
`\Njet`	N_{jet}
`\njet`	N_{jet}
`\ETjet`	$E_{\mathrm{T}}^{\mathrm{jet}}$
`\etjet`	$E_{\mathrm{T}}^{\mathrm{jet}}$
`\pTavg`	$p_{\mathrm{T}}^{\mathrm{avg}}$
`\ptavg`	$p_{\mathrm{T}}^{\mathrm{avg}}$
`\pTjet`	$p_{\mathrm{T}}^{\mathrm{jet}}$
`\ptjet`	$p_{\mathrm{T}}^{\mathrm{jet}}$
`\pTcorr`	$p_{\mathrm{T}}^{\mathrm{corr}}$
`\ptcorr`	$p_{\mathrm{T}}^{\mathrm{corr}}$
`\pTjeti`	$p_{\mathrm{T},i}^{\mathrm{jet}}$
`\ptjeti`	$p_{\mathrm{T},i}^{\mathrm{jet}}$
`\pTrecoil`	$p_{\mathrm{T}}^{\mathrm{recoil}}$
`\ptrecoil`	$p_{\mathrm{T}}^{\mathrm{recoil}}$
`\pTleading`	$p_{\mathrm{T}}^{\mathrm{leading}}$
`\ptleading`	$p_{\mathrm{T}}^{\mathrm{leading}}$
`\pTjetEM`	$p_{\mathrm{T,\,EM}}^{\mathrm{jet}}$
`\ptjetEM`	$p_{\mathrm{T,\,EM}}^{\mathrm{jet}}$
`\pThat`	$\hat{p}_{\mathrm{T}}$
`\pthat`	$\hat{p}_{\mathrm{T}}$
`\pTprobe`	$p_{\mathrm{T}}^{\mathrm{probe}}$
`\ptprobe`	$p_{\mathrm{T}}^{\mathrm{probe}}$
`\pTref`	$p_{\mathrm{T}}^{\mathrm{ref}}$
`\ptref`	$p_{\mathrm{T}}^{\mathrm{ref}}$
`\pToff`	$\mathcal{O}$
`\ptoff`	$\mathcal{O}$
`\pToffjet`	$\mathcal{O}^{\mathrm{jet}}$
`\ptoffjet`	$\mathcal{O}^{\mathrm{jet}}$
`\pTZ`	p_{T}^{Z}
`\ptZ`	p_{T}^{Z}
`\pTtrue`	$p_{\mathrm{T}}^{\mathrm{true}}$
`\pttrue`	$p_{\mathrm{T}}^{\mathrm{true}}$
`\pTtruth`	$p_{\mathrm{T}}^{\mathrm{true}}$
`\pttruth`	$p_{\mathrm{T}}^{\mathrm{true}}$
`\pTreco`	$p_{\mathrm{T}}^{\mathrm{reco}}$
`\ptreco`	$p_{\mathrm{T}}^{\mathrm{reco}}$
`\pTtrk`	$p_{\mathrm{T}}^{\mathrm{track}}$
`\pttrk`	$p_{\mathrm{T}}^{\mathrm{track}}$
`\ptrk`	p^{track}
`\pTtrkjet`	$p_{\mathrm{T}}^{\mathrm{track\ jet}}$
`\pttrkjet`	$p_{\mathrm{T}}^{\mathrm{track\ jet}}$
`\ntrk`	n_{track}
`\EoverP`	E/p
`\Etrue`	E^{truth}
`\Etruth`	E^{truth}
`\Ecalo`	E^{jet}
`\EcaloEM`	$E_{\mathrm{EM}}^{\mathrm{jet}}$
`\asym`	$\mathcal{A}$
`\Response`	$\mathcal{R}$
`\Rcalo`	$\mathcal{R}^{\mathrm{jet}}$

`\RcaloM`	$\mathcal{R}^{\text{jet}}_{M}$	`\JVT`	JVT
`\RcaloEM`	$\mathcal{R}^{\text{jet}}_{\text{EM}}$	`\ghostpt`	g_t
`\RMPF`	$\mathcal{R}_{\text{MPF}}$	`\ghostptavg`	$\langle g_t \rangle$
`\EcaloCALIB`	E^{jet}	`\ghostfm`	g_μ
`\RcaloCALIB`	$\mathcal{R}^{\text{jet}}$	`\ghostfmi`	$g_{\mu,i}$
`\EcaloEMJES`	$E^{\text{jet}}_{\text{EM+JES}}$	`\ghostdensity`	ν_g
`\RcaloEMJES`	$\mathcal{R}^{\text{jet}}_{\text{EM+JES}}$	`\ghostrho`	$\nu_g \langle g_t \rangle$
`\EcaloGCWJES`	$E^{\text{jet}}_{\text{GCW+JES}}$	`\Aghost`	A_g
`\RcaloGCWJES`	$\mathcal{R}^{\text{jet}}_{\text{GCW+JES}}$	`\Amu`	A_μ
`\EcaloLCWJES`	$E^{\text{jet}}_{\text{LCW+JES}}$	`\Amui`	$A_{\mu,i}$
`\RcaloLCWJES`	$\mathcal{R}^{\text{jet}}_{\text{LCW+JES}}$	`\jetarea`	A^{jet}
`\Rtrack`	$\mathcal{R}^{\text{track jet}}$	`\jetareafm`	A^{jet}_{μ}
`\rtrk`	r_{trk}	`\jetareai`	A^{jet}_{i}
`\Rtrk`	R_{trk}	`\Rkt`	R_{k_t}
`\rtrackjet`	$r^{\text{calo / track jet}}$	`\pTmuslope`	$\partial\langle \Delta p_{\text{T}} \rangle / \partial \langle \mu \rangle$
`\rtrackjetiso`	$r^{\text{calo / track jet}}_{\text{iso}}$	`\ptmuslope`	$\partial\langle \Delta p_{\text{T}} \rangle / \partial \langle \mu \rangle$
`\rtrackjetnoniso`	$r^{\text{calo / track jet}}_{\text{non-iso}}$	`\pTnpvslope`	$\partial\langle \Delta p_{\text{T}} \rangle / \partial N_{\text{PV}}$
`\rtrackjetisoratio`	$r^{\text{calo / track jet}}_{\text{non-iso/iso}}$	`\ptnpvslope`	$\partial\langle \Delta p_{\text{T}} \rangle / \partial N_{\text{PV}}$
`\gammajet`	γ-jet	`\pTmuunc`	$\Delta\left(\partial\langle \Delta p_{\text{T}} \rangle / \partial \langle \mu \rangle\right)$
`\deltaphijetgamma`	$\Delta\phi_{\text{jet-}\gamma}$	`\ptmuunc`	$\Delta\left(\partial\langle \Delta p_{\text{T}} \rangle / \partial \langle \mu \rangle\right)$
`\rapjet`	y	`\pTnpvunc`	$\Delta\left(\partial\langle \Delta p_{\text{T}} \rangle / \partial N_{\text{PV}}\right)$
`\etajet`	η	`\ptnpvunc`	$\Delta\left(\partial\langle \Delta p_{\text{T}} \rangle / \partial N_{\text{PV}}\right)$
`\phijet`	ϕ	`\sumPt`	$\sum \vec{p}_{\text{T}}$
`\etaDet`	η_{det}	`\sumpt`	$\sum \vec{p}_{\text{T}}$
`\etatrk`	η^{track}	`\sumpTtrk`	$\sum p^{\text{track}}_{\text{T}}$
`\Rmin`	R_{min}	`\sumpttrk`	$\sum p^{\text{track}}_{\text{T}}$
`\DeltaR`	ΔR	`\nPUtrk`	$n^{\text{PU}}_{\text{trk}}$
`\DetaDphi`	$\sqrt{(\Delta\eta)^2 + (\Delta\phi)^2}$	`\mjet`	m^{jet}
`\Deta`	$\lvert\Delta\eta\rvert$	`\mlead`	m^{jet}_{1}
`\Drap`	$\lvert\Delta y\rvert$	`\mleadavg`	$\langle m^{\text{jet}}_{1} \rangle$
`\DetaOneTwo`	$\lvert\Delta\eta(\text{jet1}, \text{jet2})\rvert$	`\Mjet`	m^{jet}
`\DyDphi`	$\sqrt{(\Delta y)^2 + (\Delta\phi)^2}$	`\massjet`	m^{jet}
`\DeltaRdef`	$\Delta R = \sqrt{(\Delta\eta)^2 + (\Delta\phi)^2}$	`\masscorr`	m^{corr}
`\DeltaRydef`	$\Delta R = \sqrt{(\Delta y)^2 + (\Delta\phi)^2}$	`\mthresh`	$M_{\text{threshold}}$
`\DeltaRtrk`	$\Delta R(\text{trk}_1, \text{trk}_2)$	`\mjetavg`	$\langle m^{\text{jet}} \rangle$
`\JVF`	JVF	`\masstrkjet`	$m^{\text{track jet}}$
`\cJVF`	corrJVF	`\width`	w
`\RpT`	R_{pT}	`\wcalo`	w^{calo}

`\wtrk`	w^{track}
`\shapeV`	$\mathcal{V}$
`\pTsubjet`	$p_{\mathrm{T}}^{\mathrm{subjet}}$
`\ptsubjet`	$p_{\mathrm{T}}^{\mathrm{subjet}}$
`\sjone`	j_1
`\sjtwo`	j_2
`\msubjone`	m^{j_1}
`\msubjtwo`	m^{j_2}
`\pTsubji`	p_T^i
`\ptsubji`	p_T^i
`\pTsubjone`	$p_T^{j_1}$
`\ptsubjone`	$p_T^{j_1}$
`\pTsubjtwo`	$p_T^{j_2}$
`\ptsubjtwo`	$p_T^{j_2}$
`\Rsubjets`	R_{j_1,j_2}
`\DRsubjets`	$\Delta R_{j_1,j_2}$
`\yij`	y_{ij}
`\dcut`	d_{cut}
`\dmin`	d_{min}
`\dij`	d_{ij}
`\Dij`	$\sqrt{d_{ij}}$
`\Donetwo`	$\sqrt{d_{12}}$
`\Dtwothr`	$\sqrt{d_{23}}$
`\yonetwo`	y_1
`\ytwothr`	y_2
`\yonetwoDef`	$y_1 = \sqrt{d_{12}}/m^{\mathrm{jet}}$
`\ytwothrDef`	$y_2 = \sqrt{d_{23}}/m^{\mathrm{jet}}$
`\xj`	x_J
`\jetFunc`	$J^{(eik),c}(m^{\mathrm{jet}}, p_{\mathrm{T}}, R)$
`\tauone`	τ_1
`\tautwo`	τ_2
`\tauthr`	τ_3
`\tauN`	τ_N
`\tautwoone`	τ_{21}
`\tauthrtwo`	τ_{32}
`\dip`	$\mathcal{D}$
`\diponetwo`	$\mathcal{D}_{12}$
`\diptwothr`	$\mathcal{D}_{23}$
`\diponethr`	$\mathcal{D}_{13}$

The macro `\etaRange` produces what you would expect: `\etaRange{-2.5}{+2.5}` produces $-2.5 \leq |\eta| < +2.5$ while `\AetaRange{1.0}` produces $|\eta| < 1.0$. The macro `\avg` can be used for average values: `\avg{\mu}` produces $\langle\mu\rangle$.

9 `atlasmath.sty`

Turn on including these definitions with the option math=true and off with the option math=false.

`\boxsq`	$\Box^2$
`\grad`	$\boldsymbol{\nabla}$

The macro `\spinor` is also defined. `\spinor{u}` produces $\begin{pmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \end{pmatrix}$.

10 `atlasother.sty`

Turn on including these definitions with the option other and off with the option other=false.

`\etpt`	$1/p_{\mathrm{T}} - 1/E_{\mathrm{T}}$
`\etptsig`	$(1/p_{\mathrm{T}} - 1/E_{\mathrm{T}})/(\sigma(1/p_{\mathrm{T}}))$
`\begL`	$10^{31}\ \mathrm{cm}^{-2}\,\mathrm{s}^{-1}$
`\lowL`	$10^{33}\ \mathrm{cm}^{-2}\,\mathrm{s}^{-1}$
`\highL`	$10^{34}\ \mathrm{cm}^{-2}\,\mathrm{s}^{-1}$
`\Epsb`	ϵ_b
`\Epsc`	ϵ_c
`\Mtau`	m_τ
`\swsq`	$\sin^2\theta_W$
`\swel`	$\sin^2\theta^{\mathrm{lept}}_{\mathrm{eff}}$
`\swsqb`	$\sin^2\overline{\theta}_W$
`\swsqon`	$\sin^2\theta_W \equiv 1 - m_W^2/m_Z^2$
`\gv`	g_{V}
`\ga`	g_{A}
`\gvbar`	$\bar{g}_{\mathrm{V}}$
`\gabar`	$\bar{g}_{\mathrm{A}}$
`\Zzv`	Z^*
`\Abb`	$A_{b\bar{b}}$
`\Acc`	$A_{c\bar{c}}$
`\Aqq`	$A_{q\bar{q}}$
`\Afb`	A_{fb}
`\GZ`	Γ_Z
`\GW`	Γ_W
`\GH`	Γ_H
`\GamHad`	Γ_{had}
`\Gbb`	$\Gamma_{b\bar{b}}$
`\Rbb`	$R_{b\bar{b}}$
`\Gcc`	$\Gamma_{c\bar{c}}$
`\Gvis`	Γ_{vis}
`\Ginv`	Γ_{inv}

11 atlasprocess.sty

Turn on including these definitions with the option process and off with the option process=false.

\btol	$b \to \ell$
\ctol	$c \to \ell$
\btoctol	$b \to c \to \ell$
\Jee	$J/\psi \to e^+e^-$
\Jmm	$J/\psi \to \mu^+\mu^-$
\Jmumu	$J/\psi \to \mu^+\mu^-$
\Wjj	$W \to jj$
\tjjb	$t \to jjb$
\Hbb	$H \to b\bar{b}$
\Hgg	$H \to \gamma\gamma$
\Hllll	$H \to ZZ^{(*)} \to \mu\mu\mu\mu$
\Hmmmm	$H \to \mu\mu\mu\mu$
\Heeee	$H \to eeee$
\Zmm	$Z \to \mu\mu$
\Zmumu	$Z \to \mu^+\mu^-$
\Zee	$Z \to ee$
\Zll	$Z \to \ell\ell$
\Zbb	$Z \to b\bar{b}$
\Wln	$W \to \ell\nu$
\Wen	$W \to e\nu$
\Wmn	$W \to \mu\nu$
\Wlnu	$W \to \ell\nu$
\Wenu	$W \to e\nu$
\Wmunu	$W \to \mu\nu$
\Wqqbar	$W \to q\bar{q}$
\Amm	$A \to \mu\mu$
\Ztautau	$Z \to \tau\tau$
\Wtaunu	$W \to \tau\nu$
\Atautau	$A \to \tau\tau$
\Htautau	$H \to \tau\tau$
\tWb	$t \to Wb$
\Wjets	W+jets
\Zjets	Z+jets
\Brjl	$\mathrm{Br}(J/\psi \to \ell^+\ell^-)$

12 atlasunit.sty

Turn on including these definitions with the option unit and off with the option unit=false.

\TeV	TeV
\GeV	GeV
\MeV	MeV
\keV	keV
\eV	eV
\TeVc	TeV/c
\GeVc	GeV/c
\MeVc	MeV/c
\keVc	keV/c
\eVc	eV/c
\TeVcc	TeV/c^2
\GeVcc	GeV/c^2
\MeVcc	MeV/c^2
\keVcc	keV/c^2
\eVcc	eV/c^2
\ifb	fb^{-1}
\ipb	pb^{-1}
\inb	nb^{-1}
\degr	$^\circ$

Lower case versions of the units also exist, e.g. \tev, \gev, \mev, \kev, and \ev.

As mentioned above, it is highly recommended to use a units package instead of these definitions. siunitx is the preferred package; a good alternative is hepunits. If either of these packages are used atlasunit.sty is not needed.

Most units that are needed in ATLAS documents are already defined by siunitx or are defined in atlaspackage.sty. A selection of them is given below. In order to use them in your document the unit should be included in \si or \SI:

\si{\TeV}	TeV
\si{\GeV}	GeV
\si{\MeV}	MeV
\si{\keV}	keV
\si{\eV}	eV
\si{\TeVc}	TeV/c
\si{\GeVc}	GeV/c
\si{\MeVc}	MeV/c
\si{\keVc}	keV/c
\si{\eVc}	eV/c
\si{\TeVcc}	TeV/c^2
\si{\GeVcc}	GeV/c^2
\si{\MeVcc}	MeV/c^2
\si{\keVcc}	keV/c^2
\si{\eVcc}	eV/c^2
\si{\nb}	nb
\si{\pb}	pb
\si{\fb}	fb
\si{\per\fb}	fb^{-1}
\si{\per\pb}	pb^{-1}
\si{\per\nb}	nb^{-1}
\si{\ifb}	fb^{-1}
\si{\ipb}	pb^{-1}
\si{\inb}	nb^{-1}
\si{\Hz}	Hz
\si{\kHz}	kHz
\si{\MHz}	MHz
\si{\GHz}	GHz
\si{\degr}	$^\circ$
\si{\m}	m
\si{\cm}	cm
\si{\mm}	mm
\si{\um}	µm
\si{\micron}	µm

13 Changes

Version 01-08-00 of `atlaslatex` included quite a few definitions from the Jet/ETmiss group. A new style file has been created `atlasjetetmiss.sty` that is not included by default. Some of the definitions from the Jet/ETmiss group are of more general use and so have been merged into existing style files:

atlasmisc.sty List of Monte Carlo generators expanded: `\POWHEGBOX`, `\POWPYTHIA`. Add MC macros with suffix 'V' for version number. `\kt`, `\antikt`, `\Antikt`, `\LO`, `\NLO`, `\NLL`, `\NNLO`, `\muF`, `\muR`. Added macros `\Runone`, `\Runtwo`, `\Runthr`, Added `\radlength` and `\StoB`. Added some standard b-tagging terms: `\btag`, `\btagged`, `\bquark`, `\bquarks`, `\bjet`, `\bjets`.

atlasparticle.sty Now includes `\pp`, `\enu`, `\munu`,

atlasprocess.sty Added `\Zbb`, `\tWb`, `\Wqqbar`, `\enu`, `\Zmumu`, `\Wlnu`, `\Wenu`, `\munu`, `\Wmunu`, `\Wjets`, `\Zjets`.

atlasheavyion.sty `\pp` moved to `atlasparticle.sty`.

14 Old macros

With the introduction of `atlaslatex` several macro names have been changed to make them more consistent. A few have been removed. The changes include:

- Kaons now have a capital 'K' in the macro name, e.g. `\Kplus` for K^+;
- `\Ztau`, `\Wtau`, `\Htau` `\Atau` have been replaced by `\Ztautau`, `\Wtautau`, `\Htautau` `\Atautau`;
- `\Ups` replaces `\ups`; the use of `\ups` to produce Υ in text mode has been removed;
- `\cm` has been removed, as it was the only length unit defined for text and math mode;
- `\mass` has been removed, as `\twomass` can do the same thing and the name is more intuitive;
- `\mA` has been removed as it conflicts with `siunitx` Version 1, which uses the name for milliamp.
- `\mathcal` rather than `\mathscr` is recommended for luminosity and aplanarity.

Quite a few macros are more related to Z physics than they are to LHC physics and have been moved to the `atlasother.sty` file, which is not included by default. There are also macros for various decay processes, `atlasprocess.sty` which are not included by default, but may be useful for how you can define your favourite process.

It used to be the case that you had to use `\MET{}` rather than just `\MET` to get the spacing right, as somehow `xspace` did not do a good job for $E_{\text{T}}^{\text{miss}}$. However, with the latest version of the packages both forms work fine. You can compare $E_{\text{T}}^{\text{miss}}$ and $E_{\text{T}}^{\text{miss}}$ and see that the spacing is correct in both cases.

References

[1] A. Buckley, *The* `hepparticles` *package for LaTeX*,
URL: https://www.ctan.org/pkg/hepparticles.