

CMS Draft Analysis Note

The content of this note is intended for CMS internal use and distribution only

2010/09/22

Head Id: 1.0

Archive Id:

Archive Date:

Search for Groups of Collimated Muons

Jim Pivarski

Abstract

Abstract

This box is only visible in draft mode. Please make sure the values below make sense.

PDFAuthor: CMS Collaboration
PDFTitle: Search for Groups of Collimated Muons
PDFSubject: CMS
PDFKeywords: CMS, physics, exotica, muons

Please also verify that the abstract does not use any user defined symbols

1 CMS papers

There are currently four kinds of CMS papers supported by this system: “CMS Note,” “CMS Internal Note,” “CMS Physics Analysis Summary,” and “CMS Conference Report.” The processing for these differs only in the header of the first page, which includes a different PDF figure for each kind. The appropriate header is chosen by the switch used in the `tdr` command.

This document only deals with papers set with PdfL^AT_EX. We found PdfL^AT_EX plus `cvs` to be a reliable system for the production of large documents such as the Physics TDRs and felt it would be useful to extend it to the production of shorter documents such as CMS Notes.

1.1 The mechanics of generating and typesetting papers

To start you will need to request a note directory in the `cvs` repository from the TDR librarian (currently Lucas Taylor). It is best to supply a list of the co-authors who are to have write access to the repository at the time of the request.

To generate output, check out your note directory from `cvs` following the example below. `contactAuthor` should be the CERN “phone” CMS username used when requesting the creation of the note directory and `noteNo` is the serial number for the note generated at the time of the request. Following the sequence below will populate your local copy of the repository with only your note and not include the other notes.

```
> project tdr
> cvs co -l notes
> eval `notes/tdr runtime -csh` # for tcsh. use -sh for bash.
> cd notes
> cvs update -d notes/contactAuthor_noteNo
> cd notes/contactAuthor_noteNo
# (create and edit your note, say mynote.tex)
> tdr --style=note b mynote
# or, to create the final version of a PAS document
> tdr --style=pas --nodraft b mynote
```

The `nodraft` switch is required to turn off the “Draft” overlay text.

If you wish to export your paper (for local work or for security), you can produce a tarball with all the necessary files with

```
> tdr --style=note --export b mynote.
```

This will function on Unix or Windows systems which have recent copies of L^AT_EX (including $\mathcal{A}_M\mathcal{S}$ -L^AT_EX) and `perl` installed. We currently use the `sectsty`, `subfigure`, `floatflt`, `fancyhdr`, `mathpazo`, `rotating`, `fancybox`, `lineno`, and `natbib` styles, which may not be included in the default distribution.

2 Document layout

2.1 Standard macros

Notes should include `ptdr-definitions.tex`, which provides definitions for many physics and CMS-related entities, e.g., GeV/c^2 . A complete list is given in Appendix A.

All style-related parameters are set in the class file included by the script and generally follow the article style. The `chapter` command is not implemented.

2.2 Title block

Please see the \LaTeX source for this file to see how the title page is generated. In general it follows the normal \LaTeX practice for title pages.

The type of note (CN, AN, Note, etc.) is set through the `--style` switch in the `tdr` script. When in draft mode, the string “Draft” is displayed on the page and the title block contains (in addition to the date), information about the cvs status of the document.

2.3 Page size, margins and fonts

The standard European paper size is A4 (210 mm x 297 mm (8.3” x 11.7”)) while American paper is US Letter (216 mm x 279 mm (8.5” x 11.0”)), somewhat wider and shorter. In the era of straight PostScript this led to difficulties, but PDF print drivers now generally supply a “shrink and center” option. In this template we have set the \LaTeX page style parameters to match the standard A4 size (see Table 1) and rely upon that option to produce an acceptable result on US Letter paper.

Do not override the default fonts. They are currently set to be Palatino and Helvetica. The math fonts have also been changed to Palatino so that they do not clash with the body text, particularly in regards to numbers and units. This means the authors should use `\text` commands to put text in subscripts and superscripts, and most importantly *do not use* `\rm` in formulas, otherwise you will end up with formulae looking like the second one below.

$$\phi = \text{a Greek letter} \tag{1}$$

$$\text{\rm CE} = \text{a mistake} \tag{2}$$

$$\tag{3}$$

Also note that the math fonts include a full set of Greek symbols in Math Italic Bold (produced with `\mathbfbold`), but only uppercase in Math Bold (`\mathbf`). Use `\boldmath` outside the math delimiters (\$) to get bold symbols: `\boldmath{\$ \alpha \otimes \beta \$}` produces $\alpha \otimes \beta \alpha$.

When Greek or symbol characters are used in the title, author, keywords or section heads, please use the `\texorpdfstring` command to provide alternate versions. Acrobat cannot deal with \TeX characters and will ignore many of them for your PDF bookmark. See the following two subsections and check the corresponding bookmarks.

(You may notice that this will produce four instances of “Package hyperref Warning: Token not allowed in a PDFDocEncoded string” in the output log.)

2.4 H₂O- α Demo

The title for this subsection was set with

```
\subsection{\texorpdfstring{H$_2$O-$\alpha$}{Water-$\alpha$}}
```

2.5 H₂O- α Demo

The title for this subsection was set with

```
\subsection{H$_2$O-$\alpha$}
```

2.6 Tables, figures

Place the captions above the object for tables, below for figures

Table 1: An example table: Current page and paragraph layout parameters. (72.27 pt = 1 in)

<code>\hoffset</code>	0.0pt	<code>\voffset</code>	0.0pt
<code>\textheight</code>	668.63976pt	<code>\textwidth</code>	455.24408pt
<code>\baselineskip</code>	0.0pt	<code>\marginparsep</code>	8.53581pt
<code>\topmargin</code>	-8.0pt		
<code>\headheight</code>	25.0pt	<code>\footskip</code>	36.0pt

Figures can include PDF files using the *includegraphics* package, which is automatically installed by our class file. Specifying both width and height forces both dimensions to be changed and causes a distortion of the figure, so only use one of the two. If neither width nor height is given, the size is taken from the Crop Box size embedded in the file, which is similar to the BoundingBox in PostScript. If there is too much white space around your figure, it may be that the Crop Box has been mis-set during a conversion from PostScript to PDF. Recommended translators on l^xplus are `epstopdf` and `ps2pdf -dEPSCrop`. Native PostScript can not be included.

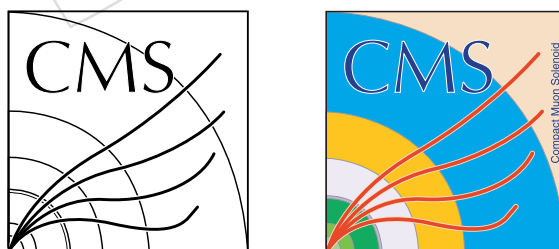


Figure 1: Figures inserted using *includegraphics*.

When including root-generated figures, please make sure to use the standard macro to set the figure parameters, and to first generate the output in eps format which is then converted to PDF.

3 Standards

Please check the *CMS Guidelines for Authors* and the *Notes for TDR authors* for authoritative information on CMS standards for publications and for tips on writing in L^AT_EX. (If you find any discrepancies between those documents and the practices in this example, please contact us.)

3.1 Standard macros

Notes include the \mathcal{AMS} -L^AT_EX class file which defines many additional math symbols, including `\gtrsim` (\gtrsim). It also allows for better control in setting equations. Please see the \mathcal{AMS} -L^AT_EX user guide for complete details.

As previously mentioned, uniformity of symbol use should be enforced through the inclusion and use of the definitions in `ptdr-definitions.tex`.

4 Submitting a note

Please follow the rules and procedures defined on the CMSDOC server, or request them by e-mail to: cmsnotes@cmsdoc.cern.ch.

5 References example

References ([? ? ?]) should use standard BibTeX citations and be placed in a separate bib file. This is included with the `\bibliograph{auto_generated}` command placed at the end of the note. We recommend the use of SLAC Spire identifiers as reference keys, where possible. This allows the reference to be easily found on Spire using the *find texkey* command. It also ensures uniqueness if the references are to be combined into a larger bib file later. See the bib file for this note for examples, including the correct use of hyperlinks.

A PTDR Symbol Definitions

If absolutely necessary, symbol definitions may be over-ridden using the `\renewcommand` command.

etal:	et al.	ORCA:	ORCA
ie:	i.e.	OSCAR:	OSCAR
eg:	e.g.	PHOTOS:	PHOTOS
etc:	etc.	PROSPINO:	PROSPINO
vs:	vs.	PYTHIA:	PYTHIA
mdash:	—	SHERPA:	SHERPA
Lone:	Level-1	TAUOLA:	TAUOLA
Ltwo:	Level-2	TOPREX:	TOPREX
Lthree:	Level-3	XDAQ:	XDAQ
ACERMC:	ACERMC	DZERO:	DØ
ALPGEN:	ALPGEN	de:	°
CHARYBDIS:	CHARYBDIS	ten{x}:	$\times 10^x$
CMKIN:	CMKIN	unit{x}:	x
CMSIM:	CMSIM	mum:	μm
CMSSW:	CMSSW	micron:	μm
COBRA:	COBRA	cm:	cm
COCOA:	COCOA	mm:	mm
COMPHEP:	COMPHEP	mus:	μs
EVTGEN:	EVTGEN	keV:	keV
FAMOS:	FAMOS	MeV:	MeV
GARCON:	GARCON	GeV:	GeV
GARFIELD:	GARFIELD	TeV:	TeV
GEANE:	GEANE	PeV:	PeV
GEANTfour:	GEANT4	keVc:	keV/c
GEANTthree:	GEANT3	MeVc:	MeV/c
GEANT:	GEANT	GeVc:	GeV/c
HDECAY:	HDECAY	TeVc:	TeV/c
HERWIG:	HERWIG	keVcc:	keV/c ²
HIGLU:	HIGLU	MeVcc:	MeV/c ²
HIJING:	HIJING	GeVcc:	GeV/c ²
IGUANA:	IGUANA	TeVcc:	TeV/c ²
ISAJET:	ISAJET	pbinv:	pb ⁻¹
ISAPYTHIA:	ISAPYTHIA	fbinv:	fb ⁻¹
ISASUGRA:	ISASUGRA	nbinv:	nb ⁻¹
ISASUSY:	ISASUSY	percms:	cm ⁻² s ⁻¹
ISAWIG:	ISAWIG	lumi:	\mathcal{L}
MADGRAPH:	MADGRAPH	Lumi:	\mathcal{L}
MCATNLO:	MC@NLO	LvLow:	$\mathcal{L} = 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$
MCFM:	MCFM	LLow:	$\mathcal{L} = 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$
MILLEPEDE:	MILLEPEDE		

197	lowlumi:	$\mathcal{L} = 2 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$	239	la:	\lesssim
198	LMed:	$\mathcal{L} = 2 \times 10^{33} \text{ cm}^{-2} \text{ s}^{-1}$	240	swsq:	$\sin^2 \theta_W$
199	LHigh:	$\mathcal{L} = 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$	241	cwsq:	$\cos^2 \theta_W$
200	hilumi:	$\mathcal{L} = 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$	242	tanb:	$\tan \beta$
201	zp:	Z'	243	tanbsq:	$\tan^2 \beta$
202	kt:	k_T	244	sidb:	$\sin 2\beta$
203	BC:	B_c	245	alpS:	α_S
204	bbarc:	$\bar{b}c$	246	alpt:	$\tilde{\alpha}$
205	bbbar:	$b\bar{b}$	247	QL:	Q_L
206	ccbar:	$c\bar{c}$	248	sQ:	\tilde{Q}
207	JPsi:	J/ψ	249	sQL:	\tilde{Q}_L
208	bspsiphi:	$B_s \rightarrow J/\psi \phi$	250	ULC:	U_L^C
209	AFB:	A_{FB}	251	sUC:	\tilde{U}^C
210	EE:	e^+e^-	252	sULC:	\tilde{U}_L^C
211	MM:	$\mu^+\mu^-$	253	DLC:	D_L^C
212	TT:	$\tau^+\tau^-$	254	sDC:	\tilde{D}^C
213	wangle:	$\sin^2 \theta_{\text{eff}}^{\text{lept}}(M_Z^2)$	255	sDLC:	\tilde{D}_L^C
214	ttbar:	$t\bar{t}$	256	LL:	L_L
215	stat:	(stat.)	257	sL:	\tilde{L}
216	syst:	(syst.)	258	sLL:	\tilde{L}_L
217	HGG:	$H \rightarrow \gamma\gamma$	259	ELC:	E_L^C
218	gev:	GeV	260	sEC:	\tilde{E}^C
219	GAMJET:	$\gamma + \text{jet}$	261	sELC:	\tilde{E}_L^C
220	PPTOJETS:	$pp \rightarrow \text{jets}$	262	sEL:	\tilde{E}_L
221	PPTOGG:	$pp \rightarrow \gamma\gamma$	263	sER:	\tilde{E}_R
222	PPTOGAMJET:	$pp \rightarrow \gamma + \text{jet}$	264	sFer:	\tilde{f}
223	MH:	M_H	265	sQua:	\tilde{q}
224	RNINE:	R_9	266	sUp:	\tilde{u}
225	DR:	ΔR	267	suL:	\tilde{u}_L
226	PT:	p_T	268	suR:	\tilde{u}_R
227	pt:	p_T	269	sDw:	\tilde{d}
228	ET:	E_T	270	sdL:	\tilde{d}_L
229	HT:	H_T	271	sdR:	\tilde{d}_R
230	et:	E_T	272	sTop:	\tilde{t}
231	Em:	E	273	stL:	\tilde{t}_L
232	Pm:	p	274	stR:	\tilde{t}_R
233	PTm:	p_T	275	stone:	\tilde{t}_1
234	ETm:	E_T^{miss}	276	sttwo:	\tilde{t}_2
235	MET:	E_T^{miss}	277	sBot:	\tilde{b}
236	ETmiss:	E_T^{miss}	278	sbL:	\tilde{b}_L
237	VEtmiss:	\vec{E}_T^{miss}			
238	ga:	\gtrsim			

279	sbR:	\tilde{b}_R	306	chip:	$\tilde{\chi}^+$
280	sbone:	\tilde{b}_1	307	chim:	$\tilde{\chi}^-$
281	sbtwo:	\tilde{b}_2	308	chipm:	$\tilde{\chi}^\pm$
282	sLep:	\tilde{l}	309	Hone:	H_d
283	sLepC:	\tilde{l}^C	310	sHone:	\tilde{H}_d
284	sEl:	\tilde{e}	311	Htwo:	H_u
285	sElC:	\tilde{e}^C	312	sHtwo:	\tilde{H}_u
286	seL:	\tilde{e}_L	313	sHig:	\tilde{H}
287	seR:	\tilde{e}_R	314	sHa:	\tilde{H}_a
288	snL:	$\tilde{\nu}_L$	315	sHb:	\tilde{H}_b
289	sMu:	$\tilde{\mu}$	316	sHpm:	\tilde{H}^\pm
290	sNu:	$\tilde{\nu}$	317	hz:	h^0
291	sTau:	$\tilde{\tau}$	318	HZ:	H^0
292	Glu:	g	319	Az:	A^0
293	sGlu:	\tilde{g}	320	Hpm:	H^\pm
294	Wpm:	W^\pm	321	sGra:	\tilde{G}
295	sWpm:	\tilde{W}^\pm	322	mtl:	\tilde{m}
296	Wz:	W^0	323	rpv:	\tilde{R}
297	sWz:	\tilde{W}^0	324	LLE:	$LL\bar{E}$
298	sWino:	\tilde{W}	325	LQD:	$LQ\bar{D}$
299	Bz:	B^0	326	UDD:	\overline{UDD}
300	sBz:	\tilde{B}^0	327	Lam:	λ
301	sBino:	\tilde{B}	328	Lamp:	λ'
302	Zz:	Z^0	329	Lampp:	λ''
303	sZino:	\tilde{Z}^0	330	MD:	M_D
304	sGam:	$\tilde{\gamma}$	331	Mpl:	M_{Pl}
305	chiz:	$\tilde{\chi}^0$	332	Rinv:	R^{-1}
			333		