

Reproducible Paper:

Writing technical papers by using Madagascar and L^AT_EX



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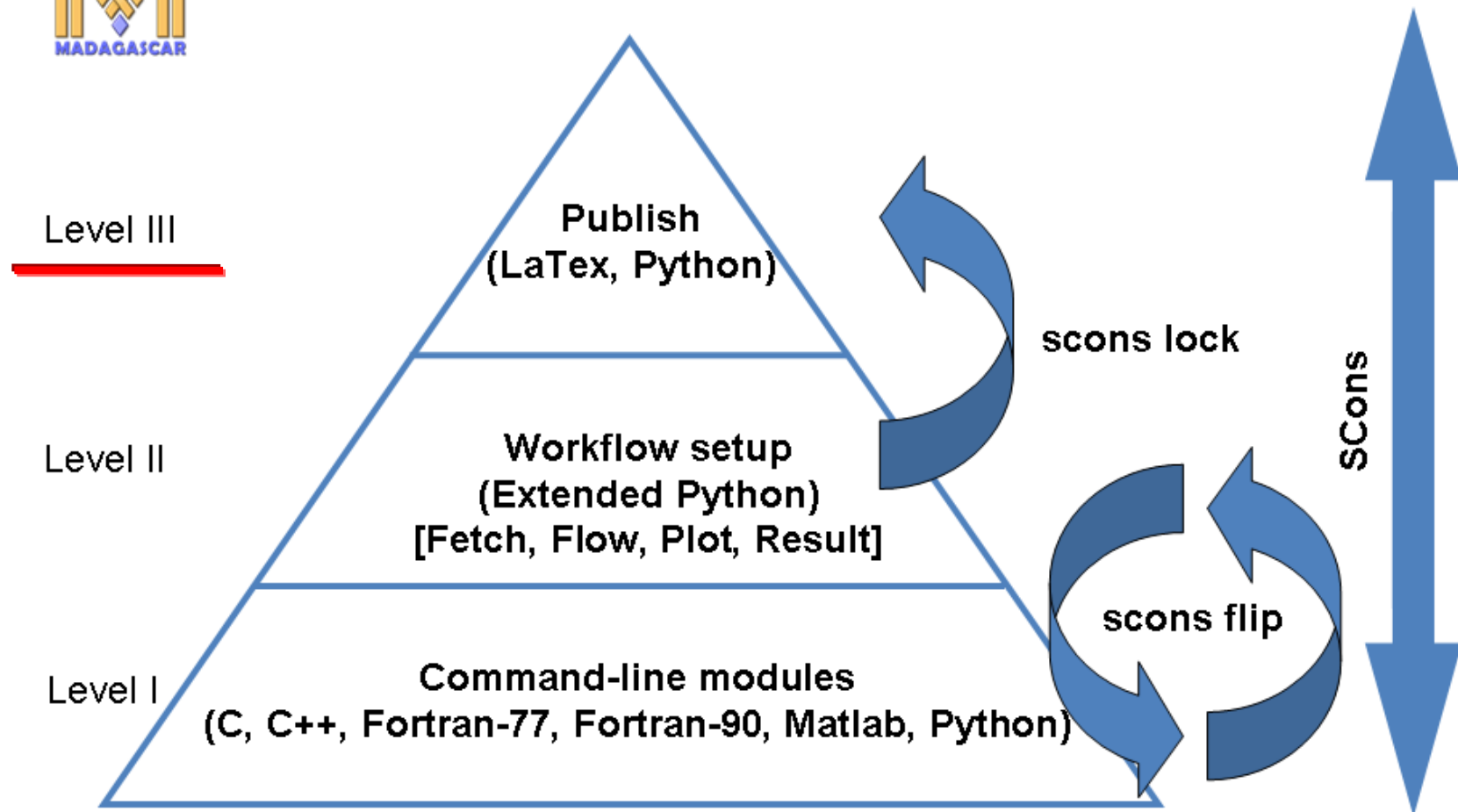
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Sep 6, 2020

Outline



Madagascar software architecture



Fomel, S, Sava, P, Vlad, I, Liu, Y, and Bashkardin, V 2013. Madagascar: open-source software project for multidimensional data analysis and reproducible computational experiments. Journal of Open Research Software 1(1): e8, DOI: <http://dx.doi.org/10.5334/jors.ag>



Outline

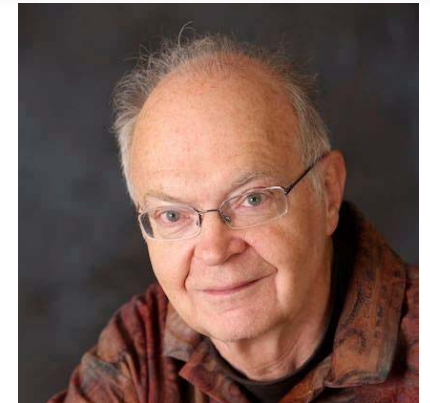
- Motivations
- How to use SEGTeX
 - Requirements
 - Implement steps
 - Rules
 - Some tips
- Simple Example

Motivations

- MS-word--> LaTeX

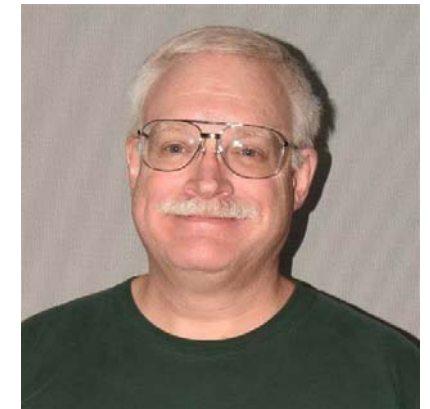
“I hope to die before I have to use Microsoft Word”

– Donald Ervin Knuth



Reasons:

- 1) Focus on paper structure and content;
- 2) Better mathematic style;
- 3) More efficient (easy comments);
- 4) Better revision for long document;
- 5) Sole high-quality text software in Linux;
- 6) Compiling by command line and supported by Madagascar.



- “All technical papers should be “reproducible” in the sense that someone of reasonable skill ought to be able to read the paper and then reproduce the results.”
– Joe Dellinger
- Remember, LaTeX is not perfect, either MS-word or LaTeX is just a tool, choose any of them you need.

SEGTex : When LaTeX meets Madagascar



download
Installation
GitHub repository
SEGTex

Introduction

Package overview
Tutorial
Hands-on tour
Reproducible documents

User Documentation

List of programs
Common programs
The RSF file format
Reproducibility with SCons

Developer documentation

Adding programs
Contributing programs
API demo: clipping data
API demo: explicit finite differences

Community

User mailing list
Developer mailing list
GitHub organization
SourceForge project
Conferences
LinkedIn group
Development blog

www.abav.org/wiki/Main_Page

Page Discussion

Read

View source

View history

Search

Create account Log in

SEGTex

SEGTex is a LaTeX package for geophysical publications. It consists of

- LaTeX2e class files for [Geophysics](#) papers, SEG expanded abstracts, etc
- BibTeX style files [seg.bst](#)
- BibTeX cumulative bibliography of geophysical publications [SEG.bib](#)
- [latex2html](#) customizations



Contents [hide]

- 1 Downloading
- 2 Installation
 - 2.1 Prerequisites
- 3 SEG expanded abstracts
- 4 Documentation
- 5 Tips and tricks
- 6 Communication
- 7 Reproducible papers
- 8 LaTeX references
- 9 News

Downloading

Access SEGTex through its [SourceForge project](#)

Alternatively, access the current working version

```
git clone https://github.com/SEGTeX
```

or using [Subversion](#) and running

```
svn co https://github.com/SEGTeX/
```

SEG DIGITAL LIBRARY FOUNDATION 中国 WIKI

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SEG Membership Events Resources Education Groups & Communities

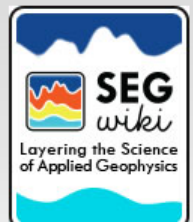
LaTeX package for paper submission to GEOPHYSICS

A typesetting package is available to help authors prepare papers for GEOPHYSICS. The package consists of a set of macros prepared for LaTeX, a popular document preparation system. The SEG has developed several macros designed specifically for GEOPHYSICS and the SEG Annual Meeting *Expanded Abstracts*.

Authors who use the LaTeX typesetting program to prepare their manuscripts can use the SEG macros (called SEGTex) to format the text, equations, references, and appendices so that they conform to GEOPHYSICS guidelines for submission. If using BibTeX to create references, authors must run BibTeX before submitting the .tex file and read in or paste the resulting contents of the generated .bbl file within the bibliography section of the .tex file. All LaTeX submissions must include only one .tex file and a PDF of that file. You may send questions concerning LaTeX files to the [SEGTex mailing list](#).

To submit papers to GEOPHYSICS, follow the procedures described in the [SEG Instructions to Authors](#) (in the January-February issue of GEOPHYSICS and on this Web site at the link above). The manuscript will undergo the standard review process. Once all revisions and changes to the manuscript are made and the manuscript is accepted, LaTeX files will be converted to Microsoft Word documents for production.

Print



Advertise with SEG





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Installation Requirements

1) Madagascar package

download from: <http://www.ahay.org/wiki/Download>

2) LaTeX package

download from: <http://www.tug.org/texlive/>

3) Text editor: emacs, gedit, vim, et al.

4) Compiler: pdflatex

5) SEGTeX:

download from: <http://www.ahay.org/wiki/SEGTeX>

More presentations about Writing

Madagascar L^AT_EX and Web tools

Sergey Fomel

Bureau of Economic Geology
Jackson School of Geosciences
University of Texas at Austin

August 30, 2006

(Fomel, School, 2006)

S. Fomel (UT Austin)

L^AT_EX and Web

Vancouver School & Workshop

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Writing a paper using Madagascar

Tariq Alkhalifah

Seismic Analysis Group (SWAG)
KAUST
swag.kaust.edu.sa

(Alkhalifah, School, 2011)

Madagascar School for Advanced Users in Qingdao 2015



Reproducible Paper:

Writing and publishing using L^AT_EX and Madagascar



Yang Liu

College of Geo-exploration Sciences and Technology
Jilin University
yangliu1979@jlu.edu.cn

Aug 8, 2015 (Liu, School, 2015)

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Madagascar School
of Reproducible Computational
Geophysics Shanghai 2017



同济大学
TONGJI UNIVERSITY

Writing a Reproducible Paper using LaTeX and Madagascar

Jiubing Cheng & Yang Liu



(Cheng and Liu, School, 2017)



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Implement steps



1) Ideas

2) Implement ideas in Madagascar and lock Figures (scons **fig.lock)**

3) Write a paper text by following SEGTeX rules

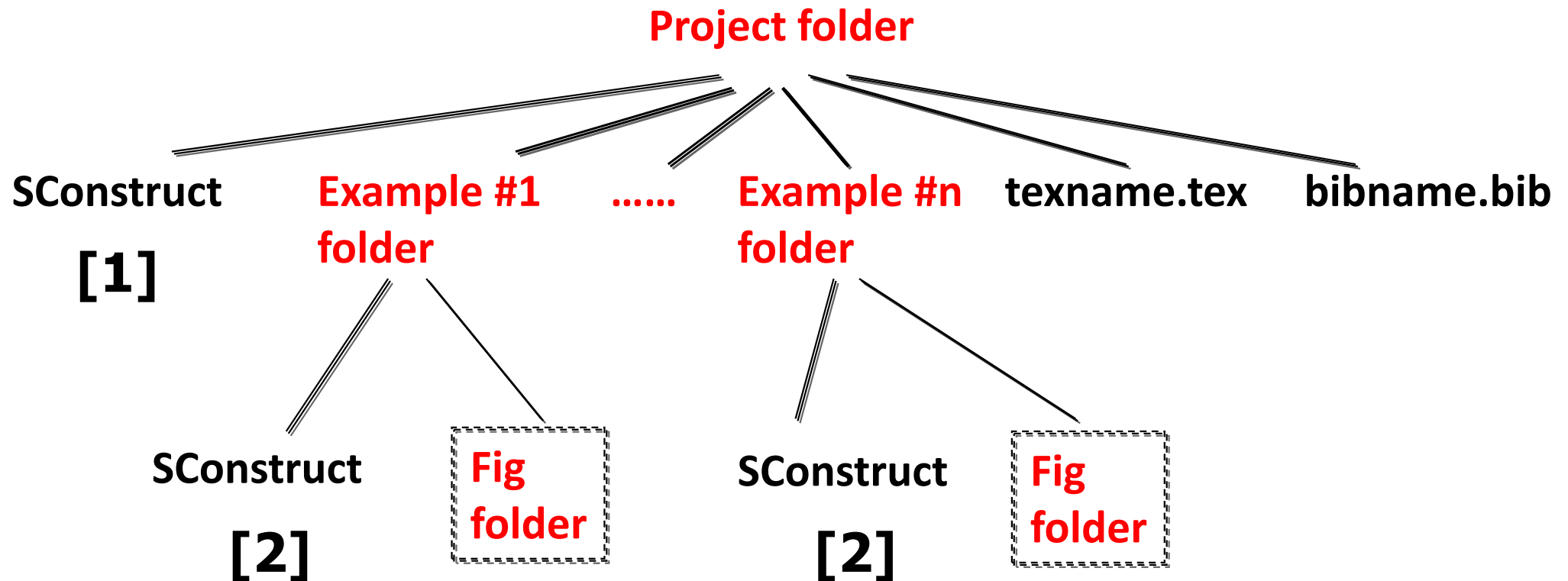
4) Insert Figures into paper by following SEGTeX rules



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Some rules



Look inside example: [~/madagascar-3.0/book/jlu/txsopf](#)

Some rules

SConstruct
[1]

Example #1
folder

SConstruct
[2]

Fig
folder

Name	Kind
▼ folder curve	Folder
SConstruct	TextEdit
▼ folder Fig	Folder
causal2d.pdf	PDF Document
noncausal2d.pdf	PDF Document
noncausal3d.pdf	PDF Document
▼ folder french	Folder
SConstruct	Unix executable
▼ folder real3d	Folder
SConstruct	TextEdit
▼ folder sigmoid	Folder
SConstruct	TextEdit
paper.bib	TeX Document
paper.tex	TeX Document
SConstruct	TextEdit

Look inside example: `~/madagascar-3.0/book/jlu/txsopf`

(1) SConstruct [1]

Some rules:

If (paper name is “paper.tex”)

```
from rsf.tex import *
```

```
End(use='listings')
```

Default is SEP report, change by lclass

else (“texname.tex”)

```
from rsf.tex import *
```

```
Paper('texname',lclass='geophysics',  
      options='noblind,manuscript',use='listings')
```

Change to Geophysics peer-review mode

```
End()
```

Commonly-used paper class

1) SEP report

no need lclass and options

2) Geophysics

`lclass='geophysics', options='manuscript'`

3) Geophysical Prospecting

`lclass='geophysics', options='manuscript,a4paper'`

4) SEG abstract

`lclass='segabs'`

5) EAGE abstract

`lclass='name', options='11pt'`

Need edit name.cls

See template "texmf/tex/latex/cwp/adam2009.cls"

Revised mode: `options='manuscript, revised'`

(2) SConstruct [2]

```
from rsf.proj import *
```

```
Fetch('Txx.HH','septour')
```

```
Result('wiggles0','Txx.HH','wiggles')
```

```
Flow('windowed','Txx.HH','window n2=10 min1=0.4 max1=0.8')
```

```
plotpar = ''
```

```
    transp=y poly=y yreverse=y pclip=100 nc=100 allpos=n''
```

```
for plot in ('wiggles','contour','grey'):
```

```
    Result(plot,'windowed',plot + plotpar)
```

```
End()
```

(3) texname.tex (for Geophysics paper)

`\title{paper title}`

`\address{\footnotemark[1] address1 \footnotemark[2] address2
\footnotemark[3] address3}`

`\author{Name1\footnotemark[1], Name2\footnotemark[2], and
Name3\footnotemark[3]}`

`\footer{GEO-2020-XXXX}`

`\lefthead{Surname1 et al.}`

`\righthead{short title}`

`\maketitle`

`\begin{abstract}`

Write paper abstract here ...

`\end{abstract}`

(3) texname.tex (for Geophysics paper)

`\section{section name, e.g., Introduction}`

The paper starts from old idea `\cite[]{\refname1}`. `\cite{\refname2}` also improve it. ...

`\section{section name, e.g., Theory}`
`\subsection{subsection name}`

The theory is shown as follows ...

```
\begin{equation}
\label{eq:eq1}
\mathbf{C} = \frac{\mathbf{A}}{b} \;,
\end{equation}
```

Refer to equation~`\ref{eq:eq1}`.

(3) texname.tex (for Geophysics paper)

`\section{section name, e.g., Synthetic examples}`

The paper has several synthetic tests...

`\inputdir{example#1 folder name}`

`\multiplot{2}{fig1,fig2}{width=0.5\textwidth}{figure1 name (a)
and figure2 name (b).}`

One can also refer to different figures, e.g.,

Figure~`\ref{fig:fig1,fig2}`a ...

`\section{section name, e.g., Field data tests}`

The method is also used to deal with field data (Figure~`\ref{fig:fig3}`).

`\inputdir{example#2 folder name}`

`\plot{fig3}{width=0.75\textwidth}{figure3 name.}`

(3) texname.tex (for Geophysics paper)

`\section{Conclusion}`

Write conclusion here...

`\section{Acknowledgments}`

Should thank anyone for useful help...

`\appendix`

`\section{Appendix: name}`

Write the content of appendix here...

`\bibliographystyle{seg}`

`\bibliography{SEG,bibname}`

Make revision available:

Use `\new{new contents}` and `\old{old contents}` to indicate “revised contents” and “replaced contents” corresponding to `SConstruct[1] “options='revised' ”`

Tricks:

Equations, citation commands, etc don't work inside `\old`.

1) Enclose citations in `\mbox`:

Instead of `\old{wrong citation \cite{wrong}}`, use `\old{wrong citation \mbox{\cite{wrong}}}`.

2) Enclose equations in \parbox or minipage

```
\old{wrong equation \\  
\begin{minipage}{\textwidth}  
\begin{equation}  
2*2 = 5  
\end{equation}  
\end{minipage}}
```

or

```
\old{wrong equation \\  
\parbox{\textwidth}{  
\begin{equation}  
2*2 = 5  
\end{equation}  
}}
```

~~```
\old{wrong equation
\begin{equation}
2*2 = 5
\end{equation}}
```~~

## (4) bibname.bib

**@Article{Abma05,**

**author = {R[] Abma and N[] Kabir},  
title = {Comparisons of interpolation methods},  
journal = {The Leading Edge},  
year = 2005,  
volume = 24,  
pages = {984-989}  
}**

**@Article{Naghizadeh09,**

**author = {M[ostafa] Naghizadeh and M[auricio] D[] Sacchi},  
title = {f-x adaptive seismic-trace interpolation},  
journal = {Geophysics},  
year = 2009,  
volume = 74,  
pages = {V9-V16}  
}**

## (4) bibname.bib

```
@book{Claerbout92,
 author = {J[on] F[] Claerbout},
 publisher = {Blackwell Scientific Publications},
 title = {{Earth Soundings Analysis: Processing Versus Inversion}},
 year = {1992}
}

@inproceedings{Curry04,
 author = {W[illiam] Curry},
 title = {Interpolation with multi-shifted-scale prediction-error filters},
 booktitle = {74th Annual International Meeting},
 year = {2004},
 publisher = {SEG, Expanded Abstracts},
 pages = {2005-2008}
}
```

**Check “texmf/bibtex/bib/seg/SEG.bib” before you start to type the references.**



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# Some tips

## 1) Label parameter:

- <http://ahay.org/blog/2007/10/27/how-do-i-change-fonts-in-vplot-graphics/>
- <http://ahay.org/blog/2008/03/26/a-journal-requires-tick-labels-on-my-plots-to-be-oriented-vertically-and-aligned-on-the-left-how-do-i-achieve-that/>
- <http://ahay.org/blog/2008/10/15/a-journal-requires-a-particular-font-e-g-arial-or-helvetica-in-figure-labels-how-do-i-achieve-that/>

## 2) Figure color:

- <http://ahay.org/blog/2005/03/28/color-schemes/>
- <http://ahay.org/blog/2013/03/19/color-palettes/>
- <http://ahay.org/blog/2013/08/23/cube-helix-color-palette/>
- <http://ahay.org/blog/2014/05/15/light-bartlein-color-palette/>
- <http://ahay.org/blog/2014/10/18/tutorial-on-colormaps/>
- <http://ahay.org/blog/2015/07/12/more-colormaps/>

# Some tips

## 3) Insert hand drawing:

(a) XFig

(b) MS-PowerPoint -> { Adobe Illustrator -> EPS/PDF file  
Adobe Acrobat Professional -> EPS/PDF file

## 4) Control figure color and resolution (SConstruct [1]):

```
Paper('name',lclass='geophysics', options='manuscript',
 use='listings', hires='fig1 fig2 fig3', color='fig4 fig5 fig6')
```

## 5) Insert only grey figures in LaTeX (SConstruct [1]):

```
from rsf.tex import *
```

```
import os
```

```
os.environ['PSTEXPENOPTS'] = 'color=n'
```

```
End(use='amsmath,hyperref',options='manuscript')
```



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# Simple Example

## Never start from scratch!

### STEP 1:

\$svn co <https://github.com/ahay/src/trunk/book/rsf/school2020> ~/school2020

### STEP 2:

\$cd ~/school2020  
\$sftour pscons lock

### STEP 3:

\$scons school2020.read

### STEP 4:

- ✓ Change examples in SConstruct[2] and LaTeX files
- ✓ Change parameters in SConstruct[1] to get different template
- ✓ Loop over STEP 2-4



**THANKS FOR ATTENTION AND HAVE A FUN!**

**Stand on each other's shoulders  
(not each other's toes)!**

**Modify/add your own data tests,  
write your own papers ...**



<http://www.ahay.org>