

Communicating Mathematics

T_EX and L^AT_EX an Overview

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Communicating Mathematics

- 1 Introduction
- 2 Markup Languages
- 3 Examples
- 4 T_EX/L^AT_EX Environments and Add-Ons
 - T_EX Environments
 - Bibliographic Database Managers
- 5 References and Suggested Reading

Communicating Mathematics

- Writer's Tools and Recommended Reading
- Mathematical Writing
- English Usage
- When English Is a Foreign Language
- Writing a Paper
- Revising a Draft
- Publishing a Paper
- Writing and Defending a Thesis
- Writing a Talk
- Giving a Talk
- Preparing a Poster
- TeX and LaTeX
- Aids and Resources for Writing and Research

T_EX/L_AT_EX

T_EX

- **T_EX** - created by Donald E. Knuth
- It is a markup language (typesetting language), in fact a programming language
- T_EX (doesn't create an image) it is a page description language
- Designed to create beautiful mathematics documents (papers, books)
- In the public domain, cross platform, very powerful, complicated, not WYSIWYG (for the most part)

T_EX/L^AT_EX

L^AT_EX

- **L^AT_EX** - created by Leslie Lamport
- L^AT_EX is a comprehensive set of markup commands (macros) used with the typesetting program T_EX
- In the public domain, cross platform
- Simplify the use of T_EX

T_EX/L^AT_EX

First Steps

For a brief overview and 10 reasons you should use T_EX/L^AT_EX

http://www.ctan.org/what_is_tex.html

The Comprehensive TeX Archive Network <http://www.ctan.org>

The TeX Users Group <http://www.tug.org>

Typographical Markup vs. Logical Markup

T_EX - Typographical Markup

He took a **bold step** forward

He took a bold step forward

html

He took a {\bf bold step} forward

TeX

Typographical Markup vs. Logical Markup

L^AT_EX - Logical Markup

Logical Markup

```
<h1>Logical Markup</h1>
```

html

```
\title{Logical Markup}
```

LaTeX

He took a *bold step* forward

```
He took a <em>bold step</em> forward
```

html

```
He took a \emph{bold step} forward
```

TeX

Examples

Equations

A displayed equation

$$b(t) = \int_{-\infty}^{\infty} k(t, s) a(s) ds$$

```
\begin{displaymath}
b(t)=\int_{-\infty}^{\infty}
k(t, s) a(s) ds.
\end{displaymath}
```

An inline equation $b(t) = \int_{-\infty}^{\infty} k(t, s) a(s) ds$

```
$b(t)=\int_{-\infty}^{\infty}
k(t, s) a(s) ds$
```

Examples

Equation Numbers and Links

$$f_n = \sum_{m=-\infty}^{\infty} k_{n-m} g_m = (k \star g)_n \quad (1)$$

Recall equation (1)

Examples

Arrays

$$K = \begin{bmatrix} k_0 & k_{N-1} & \dots & k_1 \\ k_1 & k_0 & \dots & k_2 \\ \vdots & \vdots & \ddots & \vdots \\ k_{N-1} & k_{N-2} & \dots & k_0 \end{bmatrix}_{N \times N}$$

```
\begin{displaymath}
K = \left[ \begin{array}{cccc}
k_0 & k_{N-1} & \ldots & k_{1} \\
k_1 & k_0 & \ldots & k_{2} \\
\vdots & \vdots & \ddots & \vdots \\
k_{N-1} & k_{N-2} & \ldots & k_0
\end{array} \right]_{N \times N}
\end{displaymath}
```

Examples

Tables and Floats

Table 7.4: Plant data for both units.

	Unit 1	Unit 2
Fresh feed flow rate, kg/s	16.782	13.476
Recycle HCO flow rate, kg/s	2.108	2.111
Combined feed ratio, CFR	1.1256	1.1566
Air feed temperature, K	436.	433
Hydrogen in coke, wt%	4.17	6.79

Examples

Tables and Floats

Table 7.4: Plant data for both units.

```
\medskip
\begin{tabular}{@{}lr@{.}lrl@{}}\hline
~&\multicolumn{2}{c}{${\quad}$ Unit 1} &
\multicolumn{2}{c}{{\quad}$ Unit 2}\\
\hline
Fresh feed flow rate, kg/s & {\quad}$
16&782 & {\quad}$ 13.476\\
Recycle HCO flow rate, kg/s
& 2&108 & 2.111\\
Combined feed ratio,CFR&1&1256&1.1566\\
Air feed temperature, K&436&~&433\\
Hydrogen in coke, wt\%&4&17&6.79\\
\hline \end{tabular}\\
```

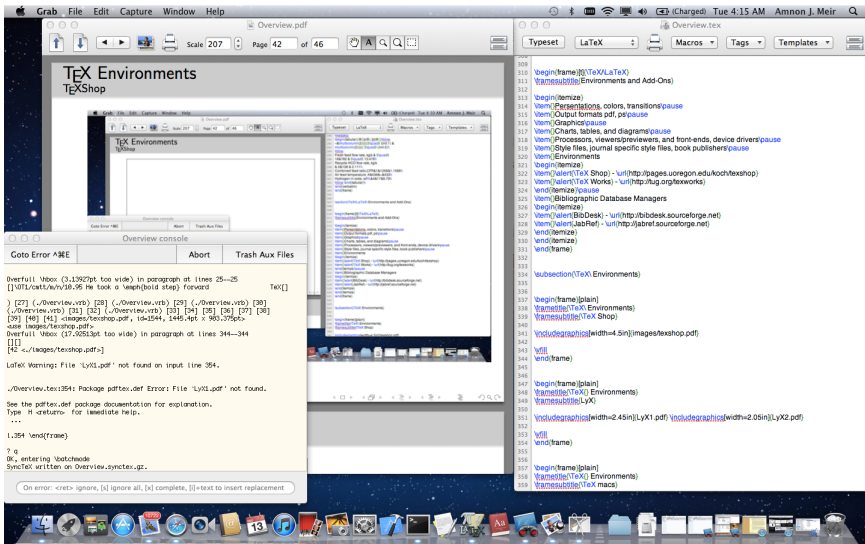
T_EX/L_AT_EX

Environments and Add-Ons

- Presentations, colors, transitions
- Output formats pdf, ps
- Graphics
- Charts, tables, and diagrams
- Processors, viewers/previewers, and front-ends, device drivers
- Style files, journal specific style files, book publishers
- Environments
 - **T_EXShop** - <http://pages.uoregon.edu/koch/texshop>
 - **T_EXWorks** - <http://tug.org/texworks>
- Bibliographic Database Managers
 - **BibDesk** - <http://bibdesk.sourceforge.net>
 - **JabRef** - <http://jabref.sourceforge.net>

TeX Environments

TeXShop



T_EX Environments

Environments/front-ends

- **T_EXShop** - <http://pages.uoregon.edu/koch/texshop>
T_EXShop is a TeX previewer for Mac OS X
- **T_EXWorks** - <http://tug.org/texworks> T_EXworks project is an effort to build a simple TeX front-end. It is deliberately modeled on T_EXShop for Mac OS X
- **LyX** - <http://www.lyx.org> LyX is a document processor that encourages an approach to writing based on the structure of your documents (WYSIWYM; what you see is what you mean) and not simply their appearance (WYSIWYG; what you see is what you get)
- **T_EXmacs** - <http://www.texmacs.org> T_EXmacs is a WYSIWYW (what you see is what you want) editing platform with special features for scientist

Bibliographic Database Managers

Bibliographic Databases

BibDesk

The screenshot shows the BibDesk application window. The title bar indicates the file is 'MathTools.bib'. The interface includes a toolbar with icons for Action, New, Edit, Delete, and TeX Preview. A search bar labeled 'Search Bibliography' is present. On the left, a sidebar shows 'GROUPS' with 'Lib...' (38) selected, and 'EXTERNAL' with 'Web (Empty)'. Below these are 'SMART', 'STATIC', and 'KEYWORDS' sections. The main table lists bibliographic entries with columns for Keyword, BibTeX, Cite Key, and Title. The entry 'Folland1998' is selected, and its details are shown in a preview pane at the bottom.

Keyword	BibTeX	Cite Key	Title
url	AMS2009		Mathscinet Mathematical Reviews on the Web
article	Boas1981		Can We Make Mathematics Intelligible?
article	Folland1998		Reviews: Handbook of Writing for the Mathematical Sciences // A Primer of Mathematical Writing
book	Gillman1987		Writing Mathematics Well: A Manual for Authors
book	Goossens1...		The LaTeX Web Companion: Integrating TeX, HT...
book	Goossens2...		The LaTeX Graphics Companion
book	Gratzer2007		More Math Into LaTeX
article	Gratzer2009a		What Is New in LaTeX? I. Breaking Free
article	Gratzer2009b		What Is New in LaTeX? II. LaTeX Implementations...
article	Gratzer2009c		What Is New in LaTeX? III. Formatting References
book	Griffiths1997		Learning LaTeX
article	Hefferon2009		The TEX Family in 2009

Selected Entry Details:

Author: Gerald B. Folland

Journal: Amer. Math. Monthly

Year: 1998

Volume: 105

Number: 8

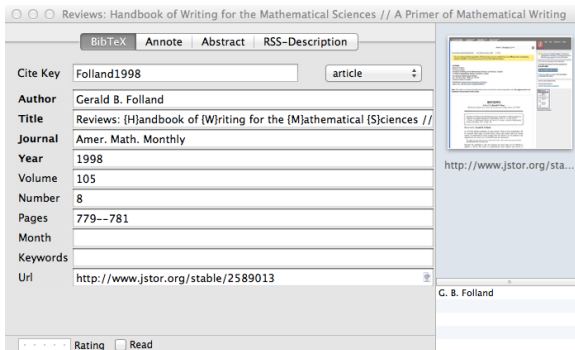
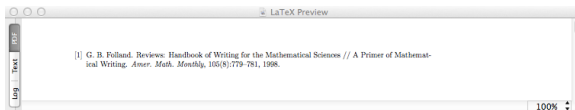
Pages:

38 publications

Bibliographic Database Managers

Bibliographic Databases

BibDesk



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