

*P*⁰*W**E**R*

*L**A**T**E**X*

Power What? Presentation Techniques with pdfL^AT_EX

Patrick W. Daly

MPS

February 23, 2005

Outline

- 1 Why L^AT_EX?
- 2 Requirements for a presentation
 - Content Requirements
 - Font Requirements
 - Dynamic Requirements
 - Processing Aids
- 3 Solutions before pdfL^AT_EX
 - SliT_EX
 - Seminar
- 4 More recent solutions
 - Several classes
 - PPower4 Post-processor
- 5 Beamer

Why \LaTeX ?

Good question

Why does one use \LaTeX in the first place?

- Better mathematics
- More control over the input
- **Personal preference** 🍷🍷🍷

This is not the place to justify \LaTeX ,
we assume you know why you want to use it.
Or why not.

Why \LaTeX ?

POW~~E~~R

PDF instead of PPT

- One produces a PDF file from the \LaTeX source file
- Best using $\pdf\LaTeX$, but also possible
 - $dvi \rightarrow ps \rightarrow pdf$ ($dvips$ plus Ghostview or Distiller)
 - $dvi \rightarrow pdf$ (with $dvipdfm$)
- Presentation made with Acrobat Reader, preferably in full screen mode

How is a presentation different from a paper

The visual support for an oral presentation normally consists of a **slide show** projected on to a screen in front of the audience.

The projected material is a mixture of text and diagrams, which may be dynamic.

- 1 Content
- 2 Fonts
- 3 Dynamics
- 4 Processing aids

Content Requirements

- ✓ Text is reduced to short sentences, or only keywords
- ✗ the audience is not going to read long novels
- ✓ Figures, diagrams, movies should support the oral statements
- ✗ but should not be so overloaded that no one can figure them out
- ✓ Mathematics should be allowed
- ✗ but a page full of equations in small type is **bad style**

All this is a matter for the author, there is no L^AT_EX style that can make him/her less verbose.

Font Requirements

- Size: Much larger than for a normal article
- Family: ideally sans serif, rather than roman fonts with serifs (Computer Modern), or even roman fonts with serifs (Times Roman)
- Colour: must match the background colour, but should not distract

L^AT_EX can manage all this, best in prepared classes or packages.

Dynamic Requirements

Alternatively: e-documents versus paper.

- Overlays: building a page in steps
- Links: being able to jump about with mouse click
- Active diagrams: figures are animated, or a movie is inserted.
- Transitions: vary the way pages are changed.
- Landscape rather than portrait: really only a requirement of computer monitor shape.

These features can be added with pdfL^AT_EX.

Special classes (and some programs) make it “*simple*”.

Value-added Processing Features

While not part of the actual output, the class/package should contains features to assist processing.

- The slides specialties (fonts, papersize, dynamics) should be preprogrammed.
- Processing of selected slides only should be possible (very useful when building up complicated figures).
- Handouts and/or a complete regular article should be available, to be output as options.

SliT_EX, or the slides class

- Even back in the old days of L^AT_EX 2.09, there was a “style” for making viewgraphs \Rightarrow *SliT_EX*
- Because fonts were hardwired in the T_EX format in those days, SliT_EX was actually a parallel format to L^AT_EX itself; i.e. it acted like a separate program.
- And it had a most complicated method of producing colour overlays for printing on black-and-white printers.

For these reasons, SliT_EX has not been taken very seriously.

- In modern L^AT_EX 2_ε, the `slides` class replaces SliT_EX, much improved, with colour management left to the `color` package.

The slides class

- makes use of a special set of sans serif fonts that are considerably larger than the regular ones
- the letters are also proportioned differently: compare
The Family (slides)
The Family (Computer Modern Sans)
The Family (Helvetica).
- supports notes and overlays, but of the kind for true viewgraphs
- can output selected slides, a big help during production.

I added some additional features like running heads/footlines, logo.
As a sample of a talk I gave in London in 2001 ...



Annales Geophysicae (2001) 19: 1–12 © European Geophysical Society 2001



First results from the RAPID imaging energetic particle spectrometer on board Cluster

B. Wilken^{1,*}, P. W. Daly¹, U. Mall¹, K. Aarsnes², D. N. Baker³, R. D. Belian⁴, J. B. Blake⁵, H. Borg⁶, J. Büchner¹, M. Carter⁷, J. F. Fennell⁸, R. Friedel⁴, T. A. Fritz⁸, F. Gliem⁹, M. Grande⁷, K. Keckemety¹⁰, G. Kettmann¹, A. Korth¹, S. Livi¹, S. McKenna-Lawlor¹¹, K. Mursula¹², B. Nikutowski¹, C. H. Perry⁷, Z. Y. Pu¹³, J. Roeder⁵, G. D. Reeves⁴, E. T. Sarris¹⁴, I. Sandahl¹⁵, F. Søråas², J. Woch¹, and Q.-G. Zong¹

¹Max-Planck-Institut für Aeronomie, Katlenburg-Lindau, D-37191 Katlenburg Lindau, Germany

²University of Bergen, Allg. 55, 5007 Bergen-U, Norway

³LASP, Boulder-CO 80309, USA

⁴LANL, Los Alamos-NM 87545, USA

⁵Aerospace Corporation, Los Angeles-CA 90009, USA

⁶IRF, 90187 Umea, Sweden

⁷RAL, Chilton, Didcot, Oxfordshire OX110QX, UK

⁸Boston University, Boston-MA 02215, USA

⁹IDA, D-38106 Braunschweig, Germany

¹⁰KFKI, H-1525 Budapest-114, Hungary

¹¹NUI, Maynooth-Co., Kildare, Ireland

¹²University of Oulu, 90571 Oulu, Finland

¹³Peking University, Beijing 100871, China

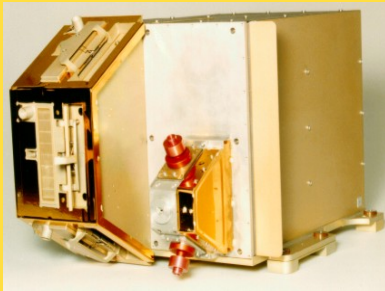
¹⁴University of Thrace, Xanthi, Greece

¹⁵IRF,S-98128 Kiruna-C, Sweden

*The RAPID team deeply regrets the untimely demise of B. Wilken, PI of the Cluster project. Without him, the RAPID instrument would never have been created



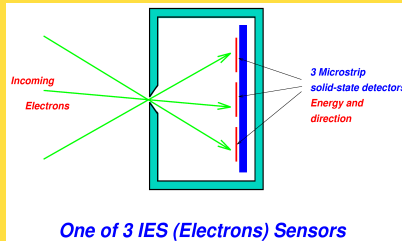
RAPID (*R*esearch with *A*daptive *P*article *I*maging *D*etectors)



is the energetic particle spectrometer on board Cluster is an advanced particle detector for the analysis of suprathermal plasma distributions in the energy range from 20–400 keV for electrons, 40 keV–1500 keV for hydrogen, and 10 keV/nucleon–1500 keV for heavier ions.



Electron (IES) Detectors

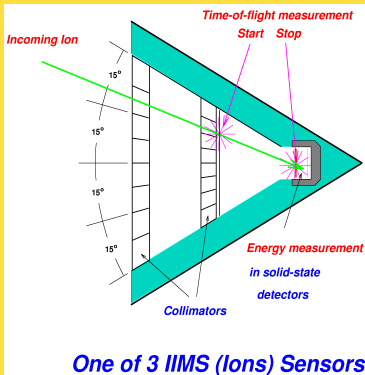


- There are 3 electron detector heads, each covering 60° in plane of spin axis;
- The heads function as a pin-hole camera, each having 3 separate detectors for a fine resolution of 20° ;
- Four read-out ('integration') times available: 2, 5, 15, 50 μs .



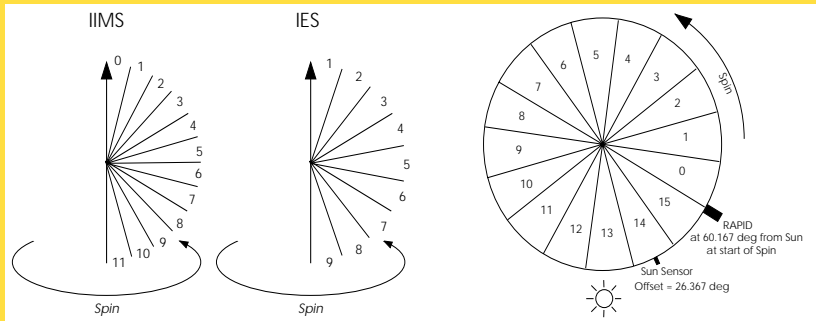
Ion (IIMS) Detectors

- There are 3 ion detector heads, each covering 60° in plane of spin axis;
- Time-of-flight mass determination: start signal: e^- from penetrated foil; stop: e^- from surface of solid-state detector;
- TOF distance is 34 mm; time resolution 80 ns/256;
- The start signal also serves to indicate incoming direction; fine resolution is 15° .





Angular Coverage in 3-D




Note: the spin axis is directed towards the *southern* ecliptic pole!

The seminar class

The `seminar` class by *Timothy van Zandt* originated in the L^AT_EX2.09 era, but has been upgraded for L^AT_EX2_ε. Together with pdfL^AT_EX and the `hyperref` package, produces acceptable results.

- has all the features of `slides`
- has no special fonts, but scales all output by a factor 2
- can mix landscape and portrait slides
- includes framed text, if wanted, plus header/footer lines
- background image can be added
- can output handout version for distribution

A sample talk that I gave last year in Kiel, with `seminar` and the PPower4 post-processor for overlay effects ...



The energetic particle spectrometer
RAPID on board Cluster—
A three-year overview

Patrick W. Daly

Max-Planck-Institut für Aeronomie
Katlenburg-Lindau

RAPID Particle Spectrometer



RAPID

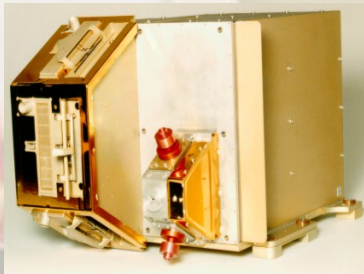
- ▶ stands for *R*esearch with *A*daptive *P*article *I*maging *D*etectors
- ▶ is one of 11 experiments on board the 4 Cluster satellites
- ▶ is an energetic ion and electron ($E > 30$ keV) imaging spectrometer.

RAPID Particle Spectrometer

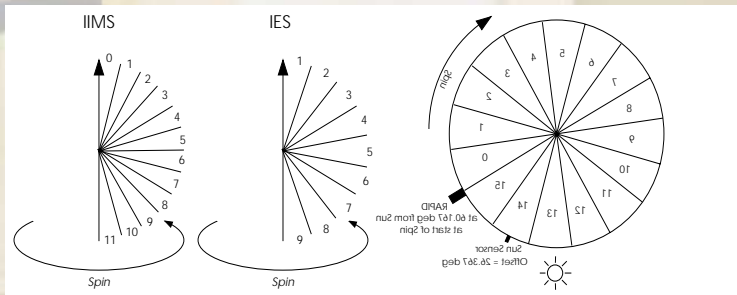
RAPID actually consists of two sets of spectrometers:

- ▶ one for ions
- ▶ one for electrons.

Each set contains three units, each covering 60° , for a total of 180° in one plane.



Angular Coverage in 3-D



Note: the spin axis is directed towards the *southern* ecliptic pole!

Some newer classes

A great deal of work is being done on this issue, and many solutions exist. Some of these are:

- FoilT_EX by Jim Hafner of IBM (non-free)
- Prosper by Frédéric Goualard, based on [seminar](#) and [PSTricks](#)
- HA-Prosper by Hendri Andriaens, based on [prosper](#)
- pdfscreen by C. V. Radhakrishnan, really for e-docs for screen viewing
- T_EXPower by Stephan Lehmké and Hans Fr. Nordhaug
- Beamer by Till Tantau, very powerful and ambitious collection.

Overlays in PDF

The overlay feature is the most important dynamic property added to the PDF file.

- With it, lists are build up successively, but also figures can be embellished with arrows, indicators, or alternatives.
- In a PDF file, this is done by breaking one page up into several.
- The previous classes try to do this by generating the one page several times, with and without the varying text.
- This requires some tricky internal programming, to get the missing text participating in the positioning calculations

P^Power4

An alternative is the P^Power4 Java script by Klaus Guntermann and Christian Spannagel.

Method:

- 1 Produce the L^AT_EX file with the special `pause` package.
- 2 Add the command `\pause` wherever a break is to occur
- 3 Generate the PDF output with `pdfLATEX`.
- 4 Run the Java script on that file, to produce a new PDF file with page breaks.

This produces the following output:-

In this example, the page number should have been present all the time.

It appears only on the last view because it is set after the last `\pause` statement.

To control this, one can set the level number explicitly.

This results in:

L^AT_EX

The `\pauselevel` command can be used to create many special effects:

- `\pauselevel{=n}` to set the level number absolutely
- `\pauselevel{=+n}` to increase the level number
- `\pauselevel{=-n}` to decrease the level number
- `\pauselevel{=n -d}` to set level number and the `\pause` incremental step
- `\pauselevel{:m}` to set maximum level for following text

This example was produced with code:

```
% Left hand minipage with text
\begin{minipage}[c]{0.4\textwidth}
RAPID actually consists of two sets of spectrometers:\pause
\begin{itemize}
  \item one for ions \pause
  \item one for electrons.\pause
\end{itemize}
Each set contains three units, each covering 60\deg, for a
total of 180\deg\ in one plane.
\end{minipage}\quad
```

```
% Right hand minipage with figure
\parbox[c]{0.5\textwidth}{%
\setlength{\unitlength}{0.01\linewidth}
\begin{picture}(100,72)
  \pause\pauselevel{=1}%
  \put(0,0){\includegraphics[width=\linewidth]{rapid}}
  \pause\pauselevel{:+0}
  \put(15,57){\color{Green}\line(-1, 0){58}}
  \put(10,40){\color{Green}\line(-4, 1){53}}
  \put(18,10){\color{Green}\line(-3, 2){61}}
  \pause\pauselevel{:+0}
  \put(40,09){\color{Red}\line(-5, 2){65}}
  \put(40,22){\color{Red}\line(-4, 1){65}}
  \put(40,32){\color{Red}\line(-6, 1){65}}
\end{picture}}
\pause\pauselevel{=1}
```

Transitions

are the way one page is replaced by another.

- These are a basic feature of the pdfT_EX program.
- But more (L^AT_EX) user-friendly commands are available
 - in the `hyperref` package
 - in the `pagetrans.tex` file (supplied with P^Power4)
 - and with `\pause`*trans* commands in the `pause` package

L^AT_EX

Pros and Cons

Advantages and disadvantages of a Post-Processor

Advantages

- Works with any L^AT_EX class
- Not dependent on L^AT_EX reprogramming
- Post-processor is a dumb program, it just does its job
- The author's interaction is entirely in the L^AT_EX file

Disadvantages

- An extra processing step is needed, using an extra program
- which needs to be installed (*I had no problem whatever*)
- Complicated arrangements with `\pauselevel` commands can become confusing (*One can define better commands*)

Pros and Cons

POWER

Conclusion

- P^Power4 is an excellent tool for adding overlay and transition effects to any L^AT_EX document.
- But if a class like Beamer can do that just as well, then one may have to reconsider.

L^AT_EX

The Beamer Class

Beamer

- **Beamer** is a L^AT_EX class and collection of packages put together by **Till Tantau** in Berlin.
- It started as an extension to **seminar**, worked on privately, with suggestions and criticism from friends.
- In Feb 2003, he used the first version for his PhD defense presentation
- and made it public on CTAN a month later.
- (Which explains why I missed it when preparing the 4th edition of the *Guide to L^AT_EX*.)

Main features

- Very much object oriented programming
Things like sidebars, header, footlines, navigation bars can be separately turned on/off, with various options, or reprogrammed at a lower level, but also with *objects*.
- Many useful and attractive *themes* are preprogrammed.
Themes are named after cities; this one is **Ilmenau**, a variation on **Berlin**.
- All requirements are fulfilled: large fonts, overlaying, transitions, backgrounds, selective processing
- and different outputs:
 - beamer** for projection, with all the overlays
 - transparency** for viewgraphs, fewer overlays
 - handout** for paper, two slides per page
 - article** a regular L^AT_EX article



Main features

- ▶ Very much object oriented programming
Things like sidebars, header, footlines, navigation bars can be separately turned on/off, with various options, or reprogrammed at a lower level, but also with *objects*.
- ▶ Many useful and attractive *themes* are preprogrammed. Themes are named after cities; this one is *Ilmenau*, a variation on *Berlin*.
- ▶ All requirements are fulfilled: large fonts, overlaying, transitions, backgrounds, selective processing
- ▶ and different outputs:
 - beamer* for projection, with all the overlays
 - transparency* for viewgraphs, fewer overlays
 - handout* for paper, two slides per page
 - article* a regular \LaTeX article

[Outline](#)[Why \$\LaTeX\$?](#)[Presentation needs](#)[Pre-pdf \$\TeX\$](#) [Recent solutions](#)[Beamer](#)

Main features

- Very much object oriented programming
Things like sidebars, header, footlines, navigation bars can be separately turned on/off, with various options, or reprogrammed at a lower level, but also with *objects*.
- Many useful and attractive *themes* are preprogrammed. Themes are named after cities; this one is **Ilmenau**, a variation on **Berlin**.
- All requirements are fulfilled: large fonts, overlaying, transitions, backgrounds, selective processing
- and different outputs:
 - beamer** for projection, with all the overlays
 - transparency** for viewgraphs, fewer overlays
 - handout** for paper, two slides per page
 - article** a regular \LaTeX article

Main features

- ▶ Very much object oriented programming
Things like sidebars, header, footlines, navigation bars can be separately turned on/off, with various options, or reprogrammed at a lower level, but also with *objects*.
- ▶ Many useful and attractive *themes* are preprogrammed.
Themes are named after cities; this one is **Ilmenau**, a variation on **Berlin**.
- ▶ All requirements are fulfilled: large fonts, overlaying, transitions, backgrounds, selective processing
- ▶ and different outputs:
 - beamer** for projection, with all the overlays
 - transparency** for viewgraphs, fewer overlays
 - handout** for paper, two slides per page
 - article** a regular \LaTeX article

Main features

- Very much object oriented programming
Things like sidebars, header, footlines, navigation bars can be separately turned on/off, with various options, or reprogrammed at a lower level, but also with *objects*.
- Many useful and attractive *themes* are preprogrammed. Themes are named after cities; this one is *Ilmenau*, a variation on *Berlin*.
- All requirements are fulfilled: large fonts, overlaying, transitions, backgrounds, selective processing
- and different outputs:
 - beamer for projection, with all the overlays
 - transparency for viewgraphs, fewer overlays
 - handout for paper, two slides per page
 - article a regular L^AT_EX article

There are alternate ways to uncover a list:

- 1 This is the first
- 2 This is the second
- 3 This is the absolutely most important thing

- 1 This is the first
- 2 This is the second
- 3 This is the absolutely most important thing

- 1 This is the first
- 2 This is the second
- 3 This is the absolutely most important thing

Specifying overlays is reasonably straight-forward.

- `\uncover<3>{Text for level 3 only}`
- `\uncover<3->{Text for level 3 and after}`
- `\uncover<+>{Text for next level and after}`
- `\pause`, works as with PPower4, like `\uncover<+>{}`
- `\only<3->{}`, like `\uncover` but text removed when not visible
- `\item<+>` for automatic incrementing in a list
- and the increment can even be made to be a default with


```
\begin{itemize}[<+>]
  \item ...
\end{itemize}
```


DOWN-D

And most important ...

You can redesign your own themes as you wish!

If you wish!

Which would make you a Beamer ...

L^AT_EX

And most im
You can rede
If you
Which would

