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# MathModePlugin

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## Description

This plugin allows you to include mathematics in a topic, with a format very similar to LaTeX. The external program `latex2html` is used to generate `gif` (or `png`) images from the math markup, and the image is then included in the page. The first time a particular expression is rendered, you will notice a lag as `latex2html` is being run on the server. Once rendered, the image is saved as an attached file for the page, so subsequent viewings will not require re-renders. When you remove a math expression from a page, its image is deleted.

Note that this plugin is called MathModePlugin, not LaTeXPlugin, because the only piece of LaTeX implemented is rendering of images of mathematics.

## Syntax Rules

**<latex [attr="value"]* > `formula` </latex>**

generates an image from the contained `formula`. In addition attribute-value pairs may be specified that are passed to the resulting `img` html tag. The only exeptions are the following attributes which take effect in the latex rendering pipeline:

- `size`: the latex font size; possible values are tiny, scriptsize, footnotesize, small, normalsize, large, Large, LARGE, huge or Huge; defaults to %LATEXFONTSIZE%
- `color`: the foreground color of the formula; defaults to %LATEXFGCOLOR%
- `bgcolor`: the background color; defaults to %LATEXBGCOLOR%

The formula will be displayed using a `math` latex environment by default. If the formula contains a latex linebreak (`\\`) then a `multline` environment of amsmath is used instead. If the formula contains an alignment sequence (`& = &`) then an `eqnarray` environment is used.

Note that the old notation using `%$formula$%` and `%\[formula\]%` is still supported but are deprecated.

If you might want to recompute the images cached for the current page then append `?refresh=on` to its url, e.g. click **here** to refresh the formulas in the examples below.

## Examples

The following will only display correctly if this plugin is installed and configured correctly.

```
<latex title="this is an example">
  \int_{-\infty}^\infty e^{-\alpha x^2} dx = \sqrt{\frac{\pi}{\alpha}}
</latex>
```

```
<latex>
```

```
  {\cal P} & = & \{f_1, f_2, \ldots, f_m\} \\
  {\cal C} & = & \{c_1, c_2, \ldots, c_m\} \\
  {\cal N} & = & \{n_1, n_2, \ldots, n_m\}
</latex>
```

```
<latex title="Calligraphics" color="orange">
  \cal
  A, B, C, D, E, F, G, H, I, J, K, L, M, \\
  \cal
  N, O, P, Q, R, S, T, U, V, W, X, Y, Z
</latex>
```

<img alt="\cal A, B, C, D, E, F, G, H, I, J, K, L, M, \\cal N, O, P, Q, R, S, T, U, V, W, X, Y, Z" class="mmpImage" src="/pub/System/MathModePlugin/_MathModePlugin_2a610dcb31a93be293067cf1a48e8c4e.png" title="Calligraphics" color="orange" size="Large" />

```
<latex>
  \sum_{i_1, i_2, \ldots, i_n} \pi * i + \sigma
</latex>
```

This is  new inline test.

| Greek letters | |
|---|---|
| \alpha | \theta |
| \beta | \iota |
| \gamma | \kappa |
| \delta | \lambda |
| \epsilon | \mu |
| \zeta | \nu |
| \eta | \xi |

# Plugin Installation Instructions

You do not need to install anything in the browser to use this extension. The following instructions are for the administrator who installs the extension on the server.

Open configure, and open the "Extensions" section. Use "Find More Extensions" to get a list of available extensions. Select "Install".

If you have any problems, or if the extension isn't available in `configure`, then you can still install manually from the command-line. See http://foswiki.org/Support/ManuallyInstallingExtensions for more help.

# Configuration

There are a set of configuration variables that an be set in different places. All of the below variables can be set in your `LocalSite.cfg` file like this:

```
$Foswiki::cfg{MathModePlugin}{<Name>} = <value>;
```

Some of the below variables can *only* be set this way, some of the may be overridden by defining the respective prefrence variable.

| Name | Preference Variable | Default |
|---|---|---|
| `HashCodeLength` | | 32 |
| | length of the hash code. If you switch to a different hash function, you will likely have to change this | |
| `ImagePrefix` | | '_MathModePlugin_' |
| | string to be prepended to any auto-generated image | |
| `ImageType` | %LATEXIMAGETYPE% | 'png' |
| | extension of the image type; possible values are 'gif' and 'png' | |
| `Latex2Img` | | '.../System/MathModePlugin/latex2img' |
| | the script to convert a latex formula to an image | |
| `LatexPreamble` | %LATEXPREAMBLE% | '\usepackage{latexsym}' |
| | latex preamble to include additional packages (e.g. \usepackage{mathptmx} to change the math font) ; note, that the packages `amsmath` and `color` are loaded too as they are obligatory | |
| `ScaleFactor` | %LATEXSCALEFACTOR% | 1.2 |
| | factor to scale images | |
| `LatexFGColor` | %LATEXFGCOLOR% | black |
| | default text color | |
| `LatexBGColor` | %LATEXBGCOLOR% | white |
| | default background color | |
| `LatexFontSize` | %LATEXFONTSIZE% | normalsize |
| | default font size | |

# Plugin Info

| | |
|---|---|
| Plugin Author: | Graeme Lufkin, Michael Daum |
| Copyright ©: | 2002 Graeme Lufkin, gwl@u.washington.edu, 2006-2009, Michael Daum http://michaeldaumconsulting.com |
| License: | GPL (GNU General Public License) |
| Plugin Version: | 4.01 |
| Change History: | |
| 23 Apr 2009: | converted to foswiki plugin |
| 07 Jan 2009: | certified for foswiki/compat; removed deprecated endRenderingHandler |
| 07 Dec 2007: | replaced `templfile` with `mktemp` in the latex2img helper script |
| 13 Nov 2007: | fixed plugin on 4.2 |
| 18 Dec 2006: | only use one bgcolor |
| 02 Oct 2006: | don't fail on hierarchical webs; backwards compatible tempfile cleanup |
| 31 Aug 2006: | added NO_PREFS_IN_TOPIC; using `xcolor` instead of `color` latex package now to be able to specify colors in html typical codes; default preamble uses latexsym now |

| | |
|---|---|
| 07 Aug 2006: | switched from latex2html to latex+dvipng+convert; added `size`, `color`, `bgcolor` to <latex> tag; rendering pngs by default now; reworked plugin settings; added a latex2img shell script; returning full latex error report |
| 04 Aug 2006: | major rewrite; fixed security issues by using the sandbox feature and creating tempfiles properly; added new <latex>...</latex> tag to support multiline formulas; better configurability; better error reporting; fixed issues where images have not been cleaned up regularly; speedup don't clean orphaned images during `view` but during `save`; speedup by adding lazy compilation and initialization; implemented a `postRenderingHandler` for T* V4; prevent auto-generated images stored in pub from being auto-attached using T* V4 |
| 03 Apr 2002: | Initial version |
| CPAN Dependencies: | none |
| Other Dependencies: | LaTeX, dvipng, ImageMagick |
| Perl Version: | 5.8 |
| Plugin Home: | Foswiki:Extensions/MathModePlugin |
| Support: | Foswiki:Support/MathModePlugin |

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This topic: System > MathModePlugin
Topic revision: r2 - 07 Jan 2009 - 18:12:29 - ProjectContributor

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