LaTeX Physics Package in MathJax
Mimicking Some of the Commands in LaTeX Physics Package

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Contents

1 LaTeX Physics Package

This extension is to mimics LaTeX Physics Package[1] in MathJax.

2 Commands not Working and Helps Needed

The following commands in the Physics Package is not implemented yet:

- All Matrix Macros
- So far everything done here is by string substitution. Whenever commands involving the following cannot be done simply by string substitution and hence not working:
  1. `*` modified command
  2. `[]` modified command
  3. variable no. of arguments

[1] http://www.ctan.org/pkg/physics

4. `()`, `[]` are used instead of `{}`

- Examples of commands that doesn't work:
  - `\dv`: has properties 1–3
  - `\qty`: has property 4

As I mentioned, everything done so far is by string substitution only. If you know more about Javascript and MathJax, and want to use the LaTeX Physics Package[2] in MathJax, please consider contributing. Some hints are given in Pull Request#16—MathJax-third-party-extensions[3] but I am too stupid to understand how the above cases should be handled.

3 Organization

`physics.xlsx` is the master file[4].

- Columns A-L are copied to test/tables.md
- Columns M-V are copied to unpacked/physics.js
- Columns M-V excluding column O are copied to test/macro.js

`License.js` is used to store the license that should be appended to the `.js` files.

Other files are built automatically by `physics.sh`. MultiMarkdown[5], UglifyJS2, LaTeX are assumed. I used it on Mac and have no idea if the way my bash script is written is OS agnostic or not.

4 Test

A test is given in index.html[6] and index.pdf. Compare the LaTeX output and HTML output and you will see which one is working or not.

Instead of extension, it can works as a macro too. See the test in macro.html[8].

[2] http://www.ctan.org/pkg/physics

[3] https://github.com/mathjax/MathJax-third-party-extensions/pull/16

[4] If you are laughing right now, you should really consider contributing. See Commands not Working and Helps Needed (chapter 2).

[5] http://fletcherpenney.net/multimarkdown/download/

[6] This relies on the CDN of MathJax. i.e. there might be a delay. To see instantaneous test, use macro.html[7].

[8] test/macro.html

Automatic Bracing	Code
$\{a\}$	`\quantity{ }`
$\{a\}$	`\qty{ }`
(a)	`\pqty{ }`
$[a]$	`\bqty{ }`
$\|a\|$	`\vqty{ }`
$\{a\}$	`\Bqty{ }`
$\|a\|$	`\absolutevalue{ }`
$\|a\|$	`\abs{ }`
$\\|a\\|$	`\norm{ }`
$a\Big\|_1^2$	`\evaluated{ }_1^2`
$a\Big\|_1^2$	`\eval{ }_1^2`
$\mathcal{O}(x)$	`\order{ }`
$[A, B]$	`\commutator{A} {B}`
$[A, B]$	`\comm{A} {B}`
$\{A, B\}$	`\anticommutator{A} {B}`
$\{A, B\}$	`\acomm{A} {B}`
$\{A, B\}$	`\poissonbracket{A} {B}`
$\{A, B\}$	`\pb{A} {B}`

Vector Notation	Code
$\mathbf{a}$	`\vectorbold{ }`
$\mathbf{a}$	`\vb{ }`
ψ	`\vb{ }`
$\boldsymbol{a}$	`\vb*{ }`
$\boldsymbol{\psi}$	`\vb*{ }`
$\vec{\mathbf{a}}$	`\vectorarrow{ }`
$\vec{\mathbf{a}}$	`\va{ }`
$\vec{\psi}$	`\va{ }`
$\vec{\boldsymbol{a}}$	`\va*{ }`
$\vec{\boldsymbol{\psi}}$	`\va*{ }`
$\hat{\mathbf{a}}$	`\vectorunit{ }`
$\hat{\mathbf{a}}$	`\vu{ }`
$\hat{\psi}$	`\vu{ }`
$\hat{\boldsymbol{a}}$	`\vu*{ }`
$\hat{\boldsymbol{\psi}}$	`\vu*{ }`
$\cdot$	`\dotproduct`
$\cdot$	`\vdot`
$\times$	`\crossproduct`
$\times$	`\cross`
$\times$	`\cp`
$\boldsymbol{\nabla}(\psi)$	`\gradient( )`
$\boldsymbol{\nabla}(\psi)$	`\grad( )`
$\boldsymbol{\nabla}[\psi]$	`\grad[ ]`
$\boldsymbol{\nabla}\psi$	`\grad{ }`
$\boldsymbol{\nabla}\cdot(\psi)$	`\divergence( )`
$\boldsymbol{\nabla}\cdot(\psi)$	`\div( )`
$\boldsymbol{\nabla}\cdot[\psi]$	`\div[ ]`
$\boldsymbol{\nabla}\cdot\psi$	`\div{ }`
$\boldsymbol{\nabla}\times(\psi)$	`\curl( )`
$\boldsymbol{\nabla}\times[\psi]$	`\curl[ ]`
$\boldsymbol{\nabla}\times\psi$	`\curl{ }`
$\nabla^2(\psi)$	`\laplacian( )`
$\nabla^2[\psi]$	`\laplacian[ ]`
$\nabla^2\psi$	`\laplacian{ }`

Operators	Code
$\sin x$	`\sin`
$\sin(x)$	`\sin( )`
$\sin^2(x)$	`\sin[2]( )`
$\operatorname{tr}\rho$	`\tr`
$\operatorname{Tr}\rho$	`\Tr`
$\operatorname{rank}M$	`\rank`
$\operatorname{erf}(x)$	`\erf( )`
$\operatorname{Res}[f(z)]$	`\Res[ ]`
$\mathcal{P}\int f(z)\,\mathrm{d}z$	`\principalvalue{ }`
$\mathcal{P}\int f(z)\,\mathrm{d}z$	`\pv{ }`
$\mathrm{P.V.}\int f(z)\,\mathrm{d}z$	`\PV{ }`
$\operatorname{Re}\{z\}$	`\Re{ }`
$\operatorname{Im}\{z\}$	`\Im{ }`

Quick Quad Text	Code
some texts	`\qqtext{ }`
some texts	`\qq{ }`
some texts	`\qq*{ }`
,	`\qcomma`
,	`\qc`
c.c.	`\qcc`
if	`\qif`
then	`\qthen`
else	`\qelse`
otherwise	`\qotherwise`
unless	`\qunless`
given	`\qgiven`
using	`\qusing`
assume	`\qassume`
since	`\qsince`
let	`\qlet`
for	`\qfor`
all	`\qall`
even	`\qeven`
odd	`\qodd`
integer	`\qinteger`
and	`\qand`
or	`\qor`
as	`\qas`
in	`\qin`

Derivatives	Code
$\mathrm{d}x$	`\differential{ }`
$\mathrm{d}x$	`\dd{ }`
d^3x	`\dd[3] {x}`
$\mathrm{d}(\cos\theta)$	`\dd( )`
$\frac{\mathrm{d}}{\mathrm{d}x}$	`\dv{ }`
$\frac{\mathrm{d}f}{\mathrm{d}x}$	`\derivative{ }{x}`
$\frac{\mathrm{d}f}{\mathrm{d}x}$	`\dv{ }{x}`
$\frac{\mathrm{d}^n f}{\mathrm{d}x^n}$	`\dv[ ]{f}{x}`
$\frac{\mathrm{d}}{\mathrm{d}x}\left(x^2+x^3\right)$	`\dv{x}( )`
$\mathrm{d}f/\mathrm{d}x$	`\dv*{ }{x}`
$\frac{\partial}{\partial x}$	`\pdv{ }`
$\frac{\partial f}{\partial x}$	`\partialderivative{ }{x}`
$\frac{\partial f}{\partial x}$	`\pdv{ }{x}`
$\frac{\partial^n f}{\partial x^n}$	`\pdv[ ]{f}{x}`
$\frac{\partial}{\partial x}\left(x^2+x^3\right)$	`\pdv{x}( )`
$\frac{\partial^2 f}{\partial x \partial y}$	`\pdv{ }{x}{y}`
$\delta F[g(x)]$	`\variation{ }`
$\delta F[g(x)]$	`\var{ }`
$\delta(E-TS)$	`\var( )`
$\frac{\delta}{\delta g}$	`\fdv{ }`
$\frac{\delta F}{\delta g}$	`\functionalderivative{ }{g}`
$\frac{\delta F}{\delta g}$	`\fdv{ }{g}`
$\frac{\delta}{\delta V}(E-TS)$	`\fdv{V}( )`
$\delta F/\delta x$	`\fdv*{ }{x}`

Dirac Bracket Notation	Code
$\vert\psi\rangle$	`\ket{ }`
$\vert\psi\rangle$	`\ket*{ }`
$\langle\psi\vert$	`\bra{ }`
$\langle\psi\vert$	`\bra*{ }`
$\langle a\vert b\rangle$	`\innerproduct{a}{b}`
$\langle a\vert b\rangle$	`\braket{a}{b}`
$\langle a\vert b\rangle$	`\braket*{a}{b}`
$\langle\psi\vert\psi\rangle$	`\braket{ }`
$\vert a\rangle\langle b\vert$	`\outerproduct{a}{b}`
$\vert a\rangle\langle b\vert$	`\dyad{a}{b}`
$\vert a\rangle\langle b\vert$	`\ketbra{a}{b}`
$\vert a\rangle\langle b\vert$	`\op{a}{b}`
$\vert a\rangle\langle b\vert$	`\ketbra*{a}{b}`
$\vert\psi\rangle\langle\psi\vert$	`\ketbra{ }`
$\langle\psi\rangle$	`\expectationvalue{ }`
$\langle\psi\rangle$	`\expval{ }`
$\langle\psi\rangle$	`\ev{ }`
$\langle\psi\vert A\vert\psi\rangle$	`\ev{ }{\psi}`
$\langle\psi\rangle$	`\ev*{ }`
$\langle\psi\rangle$	`\ev**{ }`
$\langle m\vert A\vert n\rangle$	`\matrixelement{m}{ }{n}`
$\langle m\vert A\vert n\rangle$	`\matrixel{m}{ }{n}`
$\langle m\vert A\vert n\rangle$	`\mel{m}{ }{n}`
$\langle m\vert A\vert n\rangle$	`\mel*{m}{ }{n}`
$\langle m\vert A\vert n\rangle$	`\mel**{m}{ }{n}`