

LaTeX Physics Package in MathJax

Mimicking Some of the Commands in LaTeX Physics Package

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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 file⁴.

- 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](#)

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>

⁴If you are laughing right now, you should really consider contributing. See [Commands not Working/Included][].

⁵<http://fletcherpenney.net/multimarkdown/download/>

⁶This 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
$\{a\}$	<code>\quantity{ }</code>
$\{a\}$	<code>\qty{ }</code>
(a)	<code>\pqty{ }</code>
$[a]$	<code>\bqty{ }</code>
$ a $	<code>\vqty{ }</code>
$\{a\}$	<code>\Bqty{ }</code>
$ a $	<code>\absolutevalue{ }</code>
$ a $	<code>\abs{ }</code>
$\ a\ $	<code>\norm{ }</code>
$a _1^2$	<code>\evaluated{ }_1^2</code>
$a _1^2$	<code>\eval{ }_1^2</code>
$\mathcal{O}(x)$	<code>\order{ }</code>
$[A, B]$	<code>\commutator{A} {B}</code>
$[A, B]$	<code>\comm{A} {B}</code>
$\{A, B\}$	<code>\anticommutator{A} {B}</code>
$\{A, B\}$	<code>\acomm{A} {B}</code>
$\{A, B\}$	<code>\poissonbracket{A} {B}</code>
$\{A, B\}$	<code>\pb{A} {B}</code>

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

Operators	Code
$\sin x$	<code>\sin</code>
$\sin(x)$	<code>\sin()</code>
$\sin^2(x)$	<code>\sin[2]()</code>
$\text{tr } \rho$	<code>\tr</code>
$\text{Tr } \rho$	<code>\Tr</code>
$\text{rank } M$	<code>\rank</code>
$\text{erf}(x)$	<code>\erf()</code>
$\text{Res}[f(z)]$	<code>\Res[]</code>
$\mathcal{P}\int f(z) dz$	<code>\principalvalue{ }</code>
$\mathcal{P}\int f(z) dz$	<code>\pv{ }</code>
$\text{P.V.}\int f(z) dz$	<code>\PV{ }</code>
$\text{Re}\{z\}$	<code>\Re{ }</code>
$\text{Im}\{z\}$	<code>\Im{ }</code>

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

Derivatives	Code
dx	<code>\differential{ }</code>
d^2x	<code>\dd{ }</code>
d^3x	<code>\dd[3]{x}</code>
$d(\cos \theta)$	<code>\dd()</code>
$\frac{d}{dt}$	<code>\dv{ }</code>
$\frac{dx}{dt}$	<code>\derivative{ }{x}</code>
$\frac{d^2f}{dx^2}$	<code>\dv{ }{x}</code>
$\frac{d^3f}{dx^3}$	<code>\dv[]{f}{x}</code>
$\frac{d}{dx}(x^2 + x^3)$	<code>\dv{x}()</code>
df/dx	<code>\dv*{ }{x}</code>
$\frac{\partial}{\partial x}$	<code>\pdv{ }</code>
$\frac{\partial^2 f}{\partial x^2}$	<code>\partialderivative{ }{x}</code>
$\frac{\partial^2 f}{\partial x^2}$	<code>\pdv{ }{x}</code>
$\frac{\partial^3 f}{\partial x^3}$	<code>\pdv[]{f}{x}</code>
$\frac{\partial}{\partial x}(x^2 + x^3)$	<code>\pdv{x}()</code>
$\frac{\partial^2 f}{\partial x^2}$	<code>\pdv{ }{x}{y}</code>
$\frac{\partial^2 f}{\partial x \partial y}$	<code>\pdv{ }{x}{y}</code>
$\delta F[g(x)]$	<code>\variation{ }</code>
$\delta F[g(x)]$	<code>\var{ }</code>
$\delta(E - TS)$	<code>\var()</code>
$\frac{\delta}{\delta q}$	<code>\fdv{ }</code>
$\frac{\delta F}{\delta q}$	<code>\functionalderivative{ }{g}</code>
$\frac{\delta F}{\delta q}$	<code>\fdv{ }{g}</code>
$\frac{\delta}{\delta V}(E - TS)$	<code>\fdv{V}()</code>
$\delta F/\delta x$	<code>\fdv*{ }{x}</code>

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