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

Kolen Cheung
University of California, Berkeley
khcheung@berkeley.edu

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Contents

1 LaTeX Physics Package

This extension is to mimics the LaTeX Physics Package[1] in MathJax. For details, see the GitHub pages[2] and the GitHub repository[3] of this extension.

2 Some Commands are not Working

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

[1] http://www.ctan.org/pkg/physics
[2] https://ickc.github.io/MathJax-third-party-extensions/physics/
[3] https://github.com/ickc/MathJax-third-party-extensions

2. `[]` (or `()`) is involved
3. variable no. of arguments

- Examples of commands that doesn't work: `\dv`: has all the properties mentioned above

As I mentioned, everything done so far is by string substitution only. Some hints are given in Pull Request#16—MathJax-third-party-extensions[4] but my skill is too limited to understand how the above cases should be handled. Feel free to improve it though.

3 Organization

`physics.xlsx` is the master file.

- 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 Tests

A few tests are given:

- Using MathJax's CDN[6] [7]
- Using this repository[8]
- Using this repository (unpacked version)[9]
- As a Macro[10] [11]
- As a PDF generated by LaTeX[12]: this is the reference file using the LaTeX's the Physics Package. You can compare the LaTeX output and HTML output and you will see which one is working now or yet to be implemented.

[4] https://github.com/mathjax/MathJax-third-party-extensions/pull/16
[5] http://fletcherpenney.net/multimarkdown/download/
[6] https://ickc.github.io/MathJax-third-party-extensions/physics/
[7] i.e. only the one pushed to MathJax's official third parties extensions repository is tested
[8] https://ickc.github.io/MathJax-third-party-extensions/physics/test/test-physics-js.html
[9] https://ickc.github.io/MathJax-third-party-extensions/physics/test/test-physics-js-unpacked.html
[10] https://ickc.github.io/MathJax-third-party-extensions/physics/test/macro.html
[11] Rather than as an extension loaded separately, this one is a macro put in the file directly
[12] https://ickc.github.io/MathJax-third-party-extensions/physics/index.pdf

Automatic Bracing	Code
$\left\{\frac{1}{1+\frac{1}{2}}\right\}$	`\quantity{ }`
$\left\{\frac{1}{1+\frac{1}{2}}\right\}$	`\qty{ }`
$\left(\frac{1}{1+\frac{1}{2}}\right)$	`\pqty{ }`
$\left[\frac{1}{1+\frac{1}{2}}\right]$	`\bqty{ }`
$\left\lvert\frac{1}{1+\frac{1}{2}}\right\rvert$	`\vqty{ }`
$\left\{\frac{1}{1+\frac{1}{2}}\right\}$	`\Bqty{ }`
$\left\lvert\frac{1}{1+\frac{1}{2}}\right\rvert$	`\absolutevalue{ }`
$\left\lvert\frac{1}{1+\frac{1}{2}}\right\rvert$	`\abs{ }`
$\left\lVert\frac{1}{1+\frac{1}{2}}\right\rVert$	`\norm{ }`
$\left.\frac{1}{1+\frac{1}{2}}\right\rvert_{1}^{2}$	`\evaluated{ }_1^2`
$\left.\frac{1}{1+\frac{1}{2}}\right\rvert_{1}^{2}$	`\eval{ }_1^2`
$\mathcal{O}\left(\frac{x}{2}\right)$	`\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{ }`
$\operatorname{Re}\left\{\frac{1}{1+\frac{i}{2}}\right\}$	`\Re{ }`
$\operatorname{Im}\left\{\frac{1}{1+\frac{i}{2}}\right\}$	`\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
$\left\vert\frac{\psi+\phi}{2}\right\rangle$	`\ket{ }`
$\vert\frac{\psi+\phi}{2}\rangle$	`\ket*{ }`
$\left\langle\frac{\psi+\phi}{2}\right\vert$	`\bra{ }`
$\langle\frac{\psi+\phi}{2}\vert$	`\bra*{ }`
$\left\langle\frac{\psi+\phi}{2}\middle\vert\frac{\psi+\phi}{2}\right\rangle$	`\innerproduct{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\left\langle\frac{\psi+\phi}{2}\middle\vert\frac{\psi+\phi}{2}\right\rangle$	`\braket{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\langle\frac{\psi+\phi}{2}\vert\frac{\psi+\phi}{2}\rangle$	`\braket*{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\left\langle\frac{\psi+\phi}{2}\middle\vert\frac{\psi+\phi}{2}\right\rangle$	`\braket{ }`
$\left\vert\frac{\psi+\phi}{2}\right\rangle\!\left\langle\frac{\psi+\phi}{2}\right\vert$	`\outerproduct{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\left\vert\frac{\psi+\phi}{2}\right\rangle\!\left\langle\frac{\psi+\phi}{2}\right\vert$	`\dyad{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\left\vert\frac{\psi+\phi}{2}\right\rangle\!\left\langle\frac{\psi+\phi}{2}\right\vert$	`\ketbra{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\left\vert\frac{\psi+\phi}{2}\right\rangle\!\left\langle\frac{\psi+\phi}{2}\right\vert$	`\op{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\vert\frac{\psi+\phi}{2}\rangle\!\langle\frac{\psi+\phi}{2}\vert$	`\ketbra*{\frac{\psi + \phi}{2}}{\frac{\psi + \phi}{2}}`
$\left\vert\frac{\psi+\phi}{2}\right\rangle\!\left\langle\frac{\psi+\phi}{2}\right\vert$	`\ketbra{ }`
$\left\langle\frac{\psi+\phi}{2}\right\rangle$	`\expectationvalue{ }`
$\left\langle\frac{\psi+\phi}{2}\right\rangle$	`\expval{ }`
$\left\langle\frac{\psi+\phi}{2}\right\rangle$	`\ev{ }`
$\langle\psi\vert\frac{A+B}{2}\vert\psi\rangle$	`\ev{ }{\psi}`
$\langle\frac{\psi+\phi}{2}\rangle$	`\ev*{ }`
$\langle\frac{\psi+\phi}{2}\rangle$	`\ev**{ }`
$\langle m\vert\frac{A+B}{2}\vert n\rangle$	`\matrixelement{m}{ }{n}`
$\langle m\vert\frac{A+B}{2}\vert n\rangle$	`\matrixel{m}{ }{n}`
$\langle m\vert\frac{A+B}{2}\vert n\rangle$	`\mel{m}{ }{n}`
$\langle m\vert\frac{A+B}{2}\vert n\rangle$	`\mel*{m}{ }{n}`
$\left\langle m\middle\vert\frac{A+B}{2}\middle\vert n\right\rangle$	`\mel**{m}{ }{n}`