

NAME

hyp2mat – convert hyperlynx files to octave/matlab scripts for electromagnetic simulation.

SYNOPSIS

hyp2mat [-h] [-o *outfile*] [-f *pdf/csxcad*] [-n *net*]... [*OPTIONS*]... [-v] [*infile*]

DESCRIPTION

hyp2mat 0.0.16

Converts Hyperlynx Signal–Integrity Transfer Format files to Octave/matlab scripts.

OPTIONS

-h, --help

Print help and exit

-V, --version

Print version and exit

-o, --output=*filename*

Output file. (default='–')

-f, --output-format=*ENUM*

Output file format. (possible values="csxcad", "pdf" default='pdf')

Processing options:

-n, --net=*STRING*

Import net. Repeat to import several nets. Default is importing all nets.

-l, --layer=*STRING*

Import layer. Repeat to import several layers. Default is importing all layers.

-x, --xmin=*DOUBLE*

Crop pcb. Set lower bound of x coordinate.

-X, --xmax=*DOUBLE*

Crop pcb. Set upper bound of x coordinate.

-y, --ymin=*DOUBLE*

Crop pcb. Set lower bound of y coordinate.

-Y, --ymax=*DOUBLE*

Crop pcb. Set upper bound of y coordinate.

-z, --zmin=*DOUBLE*

Crop pcb. Set lower bound of z coordinate.

-Z, --zmax=*DOUBLE*

Crop pcb. Set upper bound of z coordinate.

--grid=*DOUBLE*

Set output grid size. (default='10e-6')

--arc-precision=*DOUBLE*

Set maximum difference between perfect arc and polygonal approximation. (default='0')

--clearance=*DOUBLE*

Set default trace-to-plane clearance. (default='0.0002')

--flood=*STRING*

Flood layer with copper. Repeat to flood several layers. The value "plane_layers" floods all plane layers.

Physical properties:

--epsilon_r=*DOUBLE*

Set epsilon r of dielectric.

--loss-tangent=DOUBLE

Set loss tangent of dielectric.

--bulk-resistivity=DOUBLE Set bulk resistivity of copper (in Ohm meter).

CSXCAD output options:

--pcb-outline

Detailed board outline. (default=off)

--lossy-copper

Model copper as lossy. Default is modeling copper as perfect conductor. (default=off)

--metal-3d

Model copper layers as 3D. Default is modeling metal as 2D sheet. (default=off)

PDF output options:

--hue=DOUBLE

Set PDF color hue. Range 0.0 to 1.0 (default='0.0')

--saturation=DOUBLE

Set PDF color saturation. Range 0.0 to 1.0 (default='0.6')

--brightness=DOUBLE

Set PDF color brightness. Range 0.0 to 1.0 (default='0.9')

Debugging options:

-r, --raw

Raw output. Do not join adjacent or overlapping copper. (default=off)

-d, --debug

Increase debugging level. Repeat for more detailed debugging.

-v, --verbose

Print board summary.

Hyperlynx input files conventionally end in **.hyp**.

hyp2mat reads input from file *infile*. If no input file is specified input is read from standard in.

If no output file is specified output is to standard out.

If a syntax error occurs during conversion, error recovery is attempted. *hyp2mat* exits with zero status if conversion was successful and non-zero if not.

The **--verbose** option can be used to list board dimensions.

If only a small region of the board needs to be simulated the **--xmin --xmax --ymin --ymax --zmin** and **--zmax** options can be used to crop the board to a smaller region.

If not all layers of the board need to be simulated, the **--layers** option may be used to specify layers of interest.

If not all nets of the board need to be simulated, the **--nets** option may be used to specify nets of interest. The option **--net=?** lists all available nets.

Circles and arcs are approximated by polygons. By default a circle is approximated by an octagon. If higher accuracy is needed, set **--arc-precision** to the desired precision. This will increase the number of line segments used to draw circular, oval and oblong pads, amongst others.

To simulate a lossy dielectric, copy *AddHyperLynxDielectric.m* to your project directory and customize.

The **--flood** option floods layers with copper. The flooded copper respects trace-to-plane clearances. Copper net name is identical to layer name.

Typical use of *hyp2mat* is with simulation packages such as OpenEMS.

All lengths are in meters.

NOTES

Board outlines and copper polygons should not be self-intersecting.

Common causes of syntax errors are unquoted strings, and unassigned component values.

Unquoted strings

Error: *syntax error, unexpected STRING at 'Logo'*

Source:

```
(? REF=My Logo BOT1 L=Bottom_Layer)
```

Cause: An unquoted string contains a space (' ').

Solution:

Edit the .hyp file and put the string between double quotes:

```
(? REF="My Logo BOT1" L=Bottom_Layer)
```

Unassigned component values

Error: *syntax error, unexpected L, expecting FLOAT or STRING at 'L'*

Source:

```
(R REF="R1" VAL= L="Top")
```

Cause: Component has not been assigned a value (VAL=).

Solution:

Edit the .hyp file and assign a value to resistor R1:

```
(R REF="R1" VAL=0 L="Top")
```

or assign the resistor a value in the schematics editor and re-export to HyperLynx.

FILES

/usr/share/hyp2mat/matlab/

Supporting matlab routines for OpenEMS.

/usr/share/hyp2mat/eagle/

Examples and tutorial.

EXAMPLES

Convert pcb.hyp to pdf:

```
hyp2mat -o pcb.pdf pcb.hyp
```

Examine original Hyperlynx file:

```
hyp2mat -o pcb.pdf --raw pcb.hyp
```

Draw arcs with an accuracy of 10 mil or better:

```
hyp2mat -o pcb.pdf --arc-precision 0.000254 pcb.hyp
```

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SEE ALSO

octave(1)

OpenEMS, a free and open-source electromagnetic field solver using the FDTD method.