Designing Microstrip Patch Antenna in Matlab

Code:

```
%dielectric constant of substrate
er = 4.2

%resonant frequency in Hz
f = 2.4e9

%height of substrate in mm
h = 1.57

%free space velocity of light (multiplied by 1000 to convert m to mm)
v0 = (3e8) * (1e3)

width = (v0 / (2 * f) ) * sqrt ( (2 / (er + 1)) )

%calculating effective dielectric constant
eff = ((er + 1)/2) + ((er - 1) / (2 * sqrt(1 + (12*(h/width)))))

%calculating delta L
delta_l = h * (0.412 (((eff+0.3) * ((width/h) + 0.264))/( (eff+0.3)  *  ((width/h) + 0.264))))

%calculating L
length = (v0 / ( 2 * f * sqrt (eff))) - (2 * delta_l)

%Finally the effective length
eff_l = length + (2 * delta_l)
```

Output:

```
$octave -qf --no-window-system demo.m
er =  4.2000
f =    2.4000e+09
h =  1.5700
v0 =    3.0000e+11
width =  38.761
eff =  3.9125
delta_l =  0.64684
length =  30.304
eff_l =  31.597
```

Screenshot


Execute | Embed
demo.m
STDIN
%dielectric constant of substrate
er = 4.2
%resonant frequency in Hz
f = 2.4e9
%height of substrate in mm
h = 1.57
%free soace velocity of light (multiplied by 1000 to convert m to mm)
v0 = (3e8) * (1e3)
width = (v0 / (2 * f)) * sqrt ((2 / (er + 1)))
%calculating effective dielectric constant
eff = ((er + 1)/2) + ((er - 1) / (2 * sqrt(1 + (12*(h/width)))))
%calculating delta L
delta_l = h * (0.412 (((eff+0.3) * ((width/h) + 0.264))/((eff+0.3) * ((width/h) + 0.264))))
%calculating L
length = (v0 / (2 * f * sqrt (eff))) - (2 * delta_l)
%Finally the effective length
eff_l = length + (2 * delta_l)
Result
$octave -qf --no-window-system demo.m
er = 4.2000
f = 2.4000e+09
h = 1.5700
v0 = 3.0000e+11
width = 38.761
eff = 3.9125
delta_l = 0.64684
length = 30.304
eff_l = 31.597
warning: function ./demo.m shadows a core library function