Laborationsrapport 4

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Part 3

C = 10^-6

L = 10^-3

R = 18

RL = 10.3

U1 (V)	f (Hz)	U2 (V)
1	500	0.06
1	1000	0.1125
1	2000	0.225
1	4600	0.60
1	4800	0.65
1	5000	0.68
1	5200	0.65
1	5400	0.60
1	10000	0.325
1	20000	0.15625
1	40000	0.078

Beräkning:

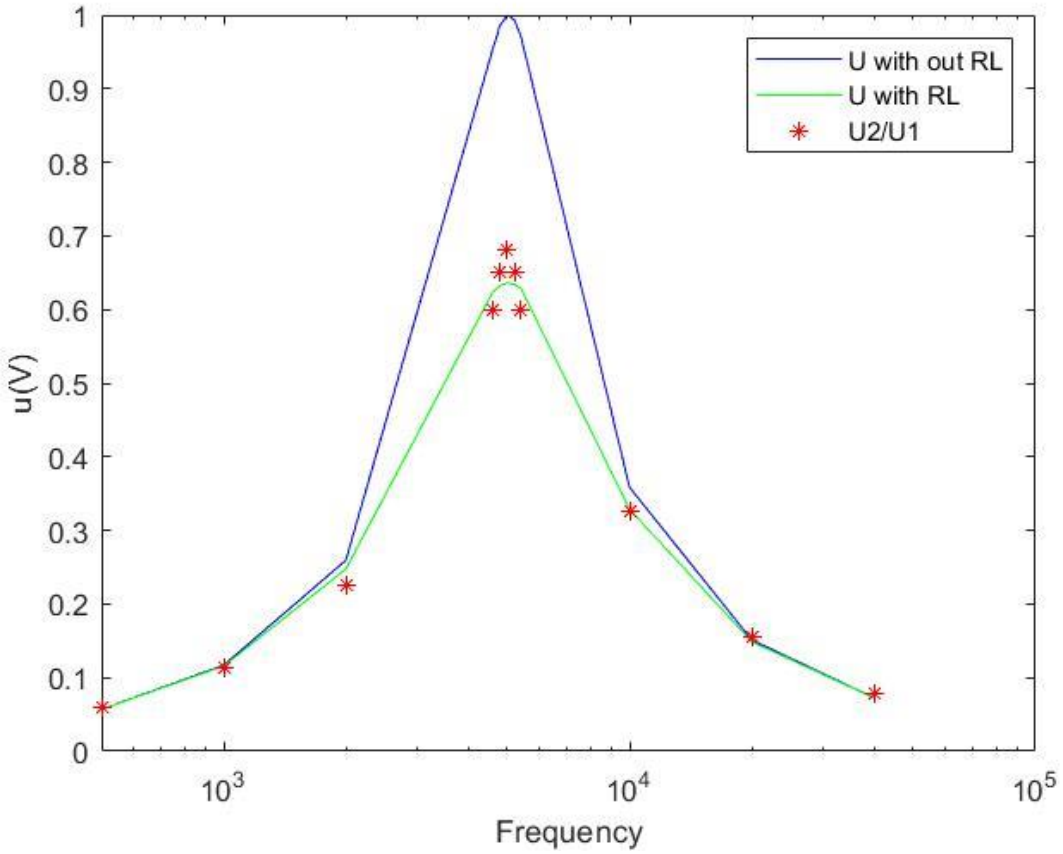
f= [500 1000 2000 4600 4800 5000 5200 5400 10000 20000 40000];

u2 = [0.06 0.1125 0.225 0.60 0.65 0.68 0.65 0.60 0.325 0.1563 0.078];

u = 1;

```
C = 10^-6;
L = 10^-3;
R = 18;
w = 2*pi*f;
RL = 10.3;

u2calc = (u * R) ./ sqrt(R^2 + (w * L - 1 ./ (w * C)).^2);
u2withRL = (u * R) ./ sqrt((R + RL)^2 + (w * L - 1 ./ (w * C)).^2);

y = u2./1;
```

Bild:



Part 4

f (Hz)	Delta t (mikro sek)	Fi (graden)
500	500	90
1000	200	72
2000	75	54
4600	2	3.312
4800	0	0
5000	2	-3.6
5200	4	-7.488
5400	5	9.72
10000	13	-46.8
20000	10	-72
40000	6	-86.4

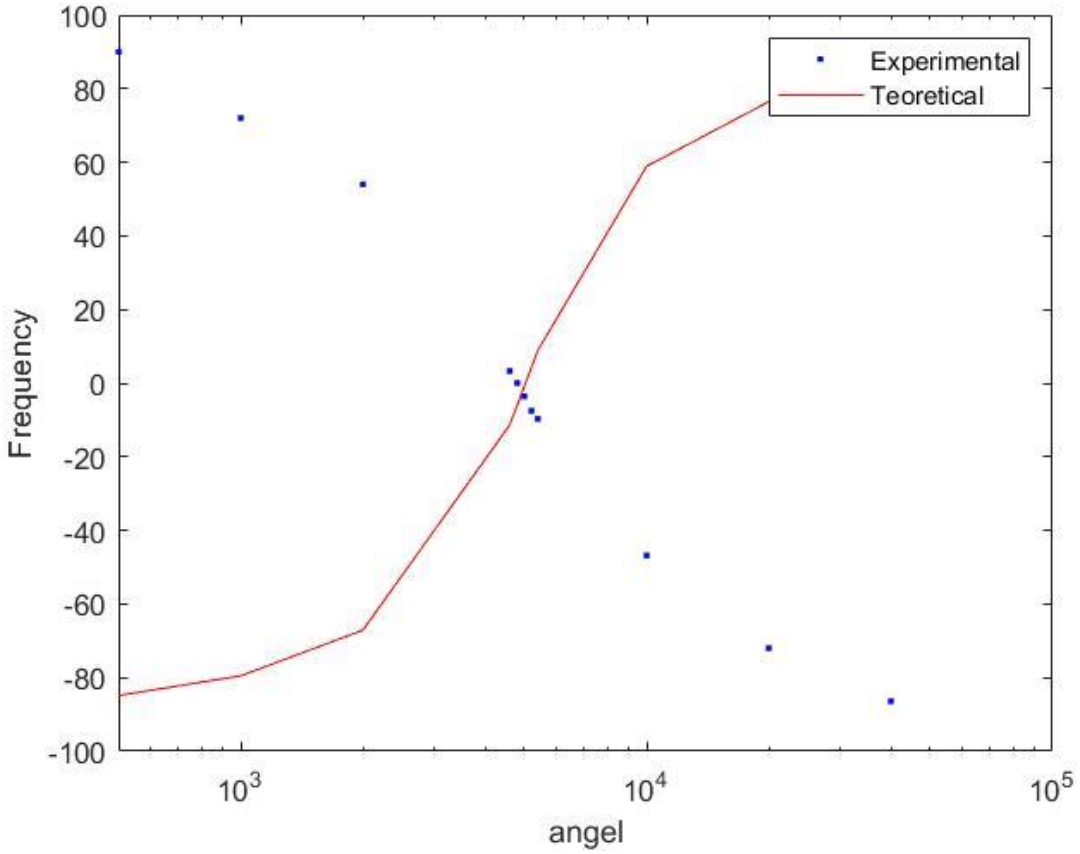
Beräkning:

f = [500 1000 2000 4600 4800 5000 5200 5400 10000 20000 40000];

dtms = [500 200 75 2 0 -2 -4 -5 -13 -10 -6];

```
dt = dtms.*10^-6;

T = 1./f;

fi = dt./T.*360

C = 10^-6;
L = 10^-3;
R = 18;
w = 2*pi*f;
RL = 10.3;

X_L = 2 * pi * f * L;
X_C = 1./ (2 * pi * f * C);

dtTeori = (1./(2*pi*f)) .*atan((X_L - X_C) / (R + RL));
fiTeori = dtTeori./T.*360;


semilogx(f, fi, '.b');
hold on
semilogx(f, fiTeori, '-r');
hold off;
```

Bild:


Experimental
Teoretical
Frequency
angel
100
80
60
40
20
0
-20
-40
-60
-80
-100
10^3
10^4
10^5