EÐL207G Verk 3

Table of Contents

Lögmál Ohm og geislunarafl ljósaperu

2

```
format shortE
err = 0.01;
```

2.1 TILRAUN

1 & 2

```
AradTengt = 4.767e-3 % A Raðtengt
AradTengtErr = AradTengt*err
```

```
AradTengt =
   4.7670e-03
AradTengtErr =
   4.7670e-05
```

```
VradTengt = 0.955 % V Raðtengt
VradTengtErr = VradTengt*err
```

```
VradTengt =
   9.5500e-01
VradTengtErr =
   9.5500e-03
```

```
AhlidTengt = 16.590e-3 % A Hliðtengt
AhlidTengtErr = AhlidTengt*err
```

```
AhlidTengt =
   1.6590e-02
AhlidTengtErr =
   1.6590e-04
```

```
VhlidTengt = 0.831 % V Hliðtengt
VhlidTengtErr = VhlidTengt*err
```

```
VhlidTengt =
   8.3100e-01
VhlidTengtErr =
```

```
   8.3100e-03
```

3 & 4

```
Rrad = VradTengt/AradTengt
RradErr = Rrad*2*err
Rhlid = VhlidTengt/AhlidTengt
RhlidErr = Rhlid*2*err

RradMdl = 100 + 100
RhlidMdl = (100*100)/(100+100)

Rrad =
   2.0034e+02
RradErr =
   4.0067e+00
Rhlid =
   5.0090e+01
RhlidErr =
   1.0018e+00
RradMdl =
   200
RhlidMdl =
    50
```

5

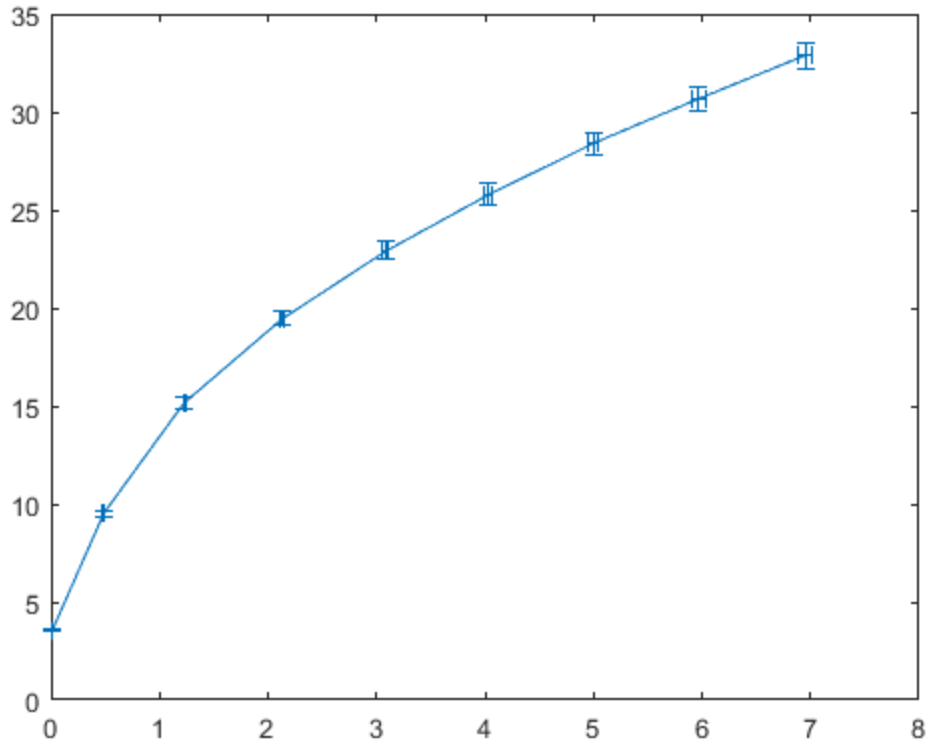
```
Wrad = AradTengt*VradTengt
WradErr = Wrad*err*2
Whlid = AhlidTengt*VhlidTengt
WhlidErr = Whlid*err*2

Wrad =
   4.5525e-03
WradErr =
   9.1050e-05
Whlid =
   1.3786e-02
WhlidErr =
   2.7573e-04
```

meira í hliðtengdu

2.2

volt plan 0,1,2,3,4,5,6,7,8

```
V = [10.6e-3,0.480,1.229,2.130,3.081,4.03,5.00,5.97,6.95];
A = [2.983,50.51,80.95,109.38,134.34,156.12,176.07,194.39,211.51]*1e-3;
R = V./A;
Rerror = (zeros(1,length(V))+1).*err*2.*R;
Verror = (zeros(1,length(A))+1).*err.*V;
fig = figure(1);
errorbar(V,R,Rerror,Rerror,Verror,Verror)
```



Nei, viðnám er háð spennu

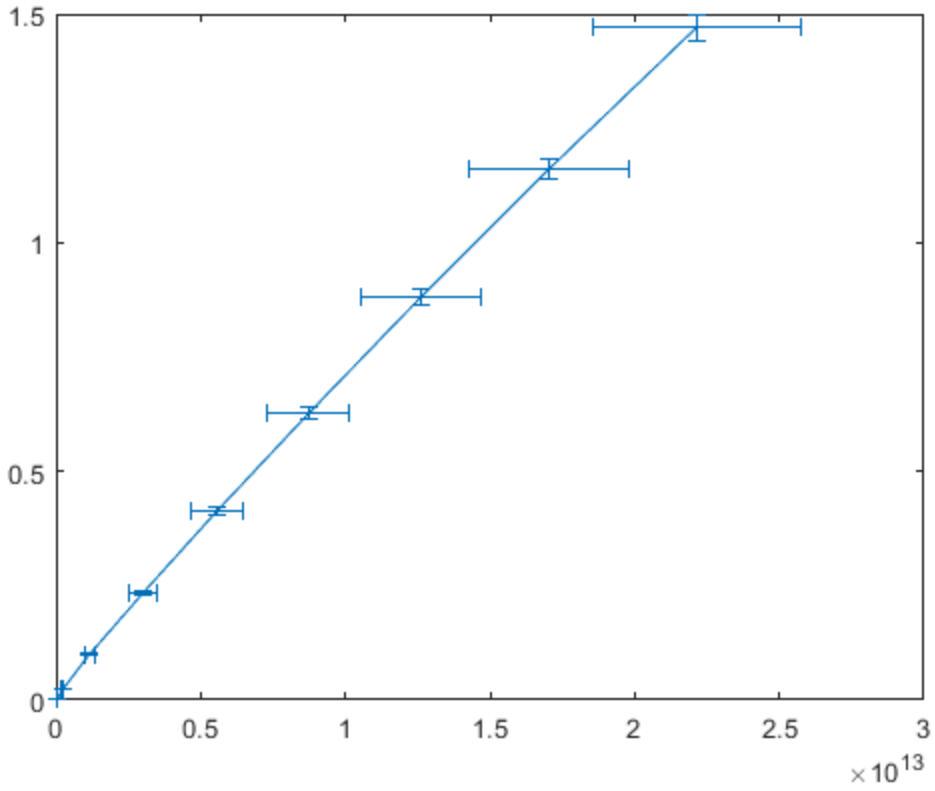
2.3

1

```
P = A.*V
alpha = 4.40e-3;
T0 = 22.6+273.15
T = (R.*R(1)^-1-1)*alpha^-1 + T0
Terror = 1 + T.*(Rerror.*R.^-1+Rerror(1).*R(1).^-1)
```

```
P =
  Columns 1 through 6
   3.1620e-05   2.4245e-02   9.9488e-02   2.3298e-01   4.1390e-01   6.2916e-01
  Columns 7 through 9
   8.8035e-01   1.1605e+00   1.4700e+00
T0 =
   2.9575e+02
T =
  Columns 1 through 6
   2.9575e+02   6.7627e+02   1.0395e+03   1.3140e+03   1.5353e+03   1.7195e+03
  Columns 7 through 9
   1.8847e+03   2.0327e+03   2.1701e+03
Terror =
  Columns 1 through 6
```

```
   1.2830e+01   2.8051e+01   4.2580e+01   5.3558e+01   6.2412e+01   6.9778e+01
  Columns 7 through 9
   7.6390e+01   8.2309e+01   8.7803e+01

T4 = T.^4
T4error = 4*T4.*Terror.*T.^-1
Perror = (zeros(1,length(P))+1).*err*2.*P

T4 =
  Columns 1 through 6
   7.6507e+09   2.0917e+11   1.1676e+12   2.9807e+12   5.5563e+12   8.7410e+12
  Columns 7 through 9
   1.2619e+13   1.7073e+13   2.2177e+13
T4error =
  Columns 1 through 6
   1.3276e+09   3.4704e+10   1.9131e+11   4.8599e+11   9.0348e+11   1.4189e+12
  Columns 7 through 9
   2.0457e+12   2.7653e+12   3.5891e+12
Perror =
  Columns 1 through 6
   6.3240e-07   4.8490e-04   1.9898e-03   4.6596e-03   8.2780e-03   1.2583e-02
  Columns 7 through 9
   1.7607e-02   2.3210e-02   2.9400e-02

2

fig = figure(1);
errorbar(T4,P,Perror,Perror,T4error,T4error)
```



3

```
slope = polyfit(T4,P,1);
slope = slope(1)
```

```
slope =
   6.6330e-14
```

```
blbDiam = 30e-6;
rhoW = 5.6e-8;

S = (R(1)*pi^2*blbDiam^3)*(4*rhoW)^-1
```

```
S =
   4.2273e-06
```

```
steffBoltz = 5.670367e-8;

epsilon = slope*steffBoltz^-1*S^-1
```

```
epsilon =
   2.7671e-01
```

```
slopeError = slope*((T4error(1)+T4error(9))/(T(9)^4)+(Perror(1)+Perror(9))/
P(9))
```

```
slopeError =
   1.2066e-14
```

```
Serror = S*Rerror(1)*R(1)^-1
```

```
Serror =
   8.4547e-08
```

```
epsilonError = epsilon*(slopeError/slope+Serror/S)
```

```
epsilonError =
   5.5870e-02
```

```
close(fig)
```

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