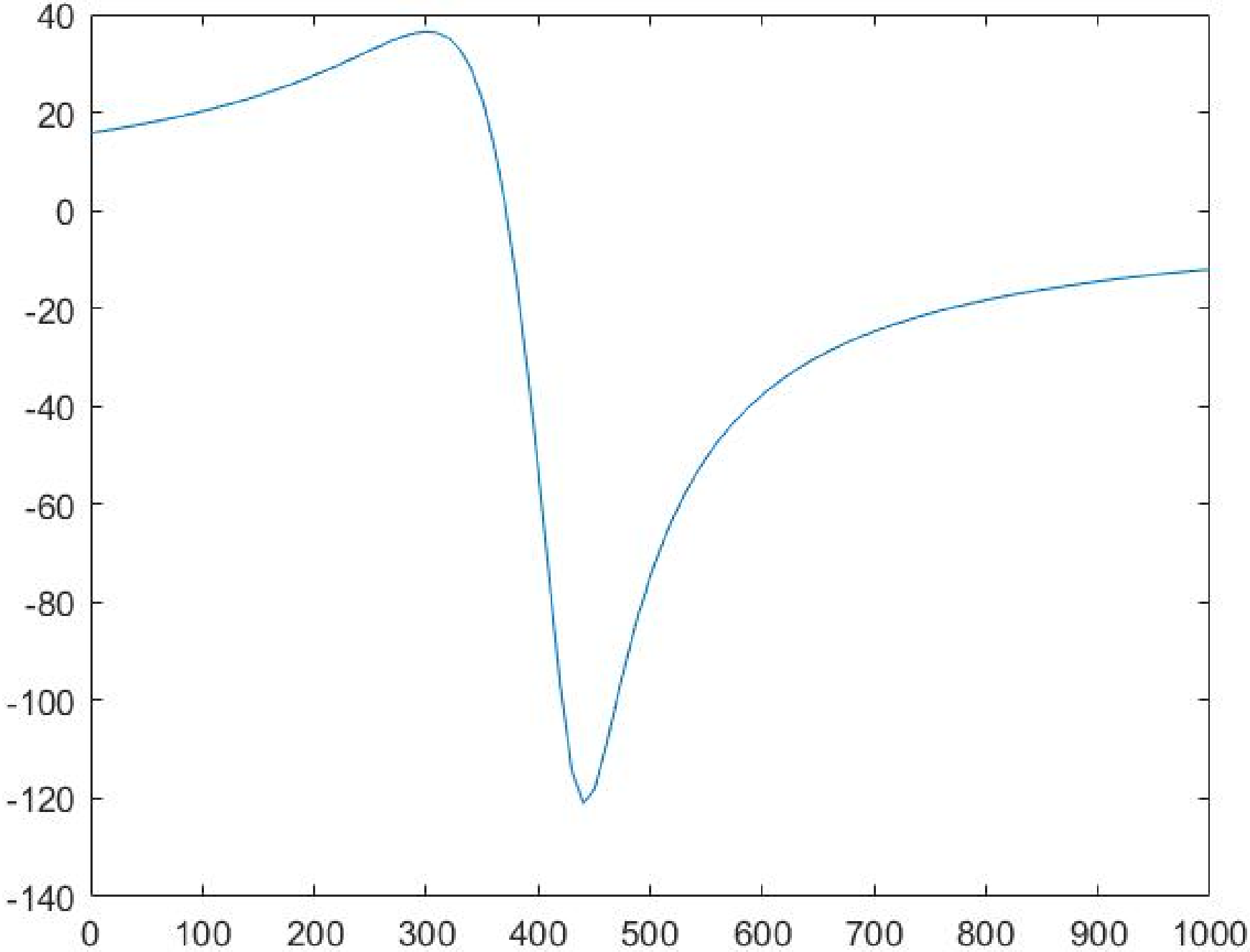
NAME:Utkarsh Jaiswal

ROLL NO: 18EX20030

Lab Assignment

```
%18EX20030 UTKARSH JAISWAL
clear all
close all
clc
xi=linspace(0,1000,101);
h=50;
k=50;
a=40;
al=30*pi/180; xo=400;
V=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,V)
```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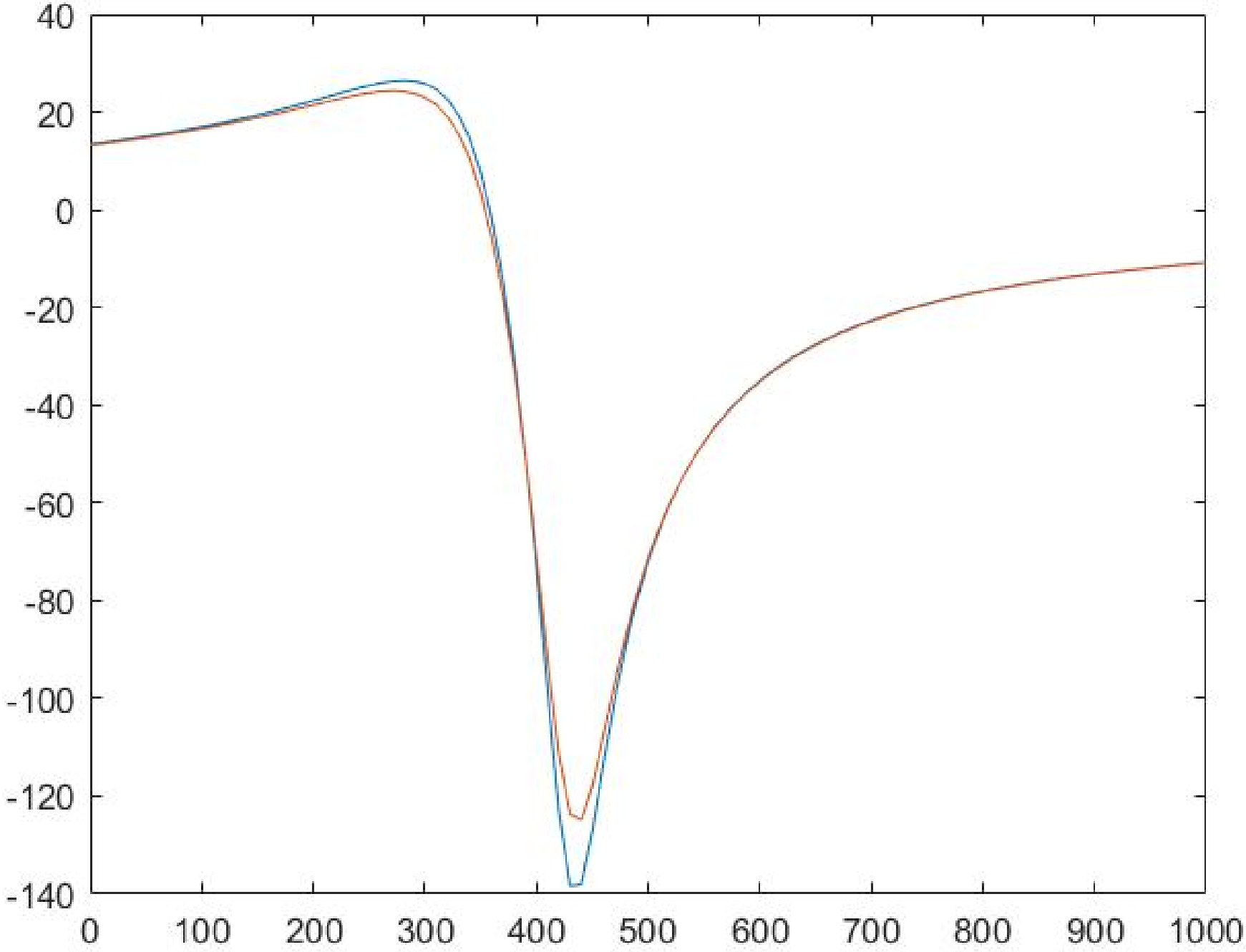
```
%18EX20030 UTKARSH JAISWAL
clear all
close all
clc
xi=linspace(0,1000,101);
h=50;
k=50;
a=40;
al=(40*pi)/180;
xo=400;
Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vi)
hold on;
h=55;
k=50;
a=40;
al=(40*pi)/180;
xo=400;
Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vnew)
s=0;
for i = 1:length(xi)
    s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
end
misfiterror=100*((s/length(xi))^0.5)
```

Command Window

```
misfiterror =

   10.4149
```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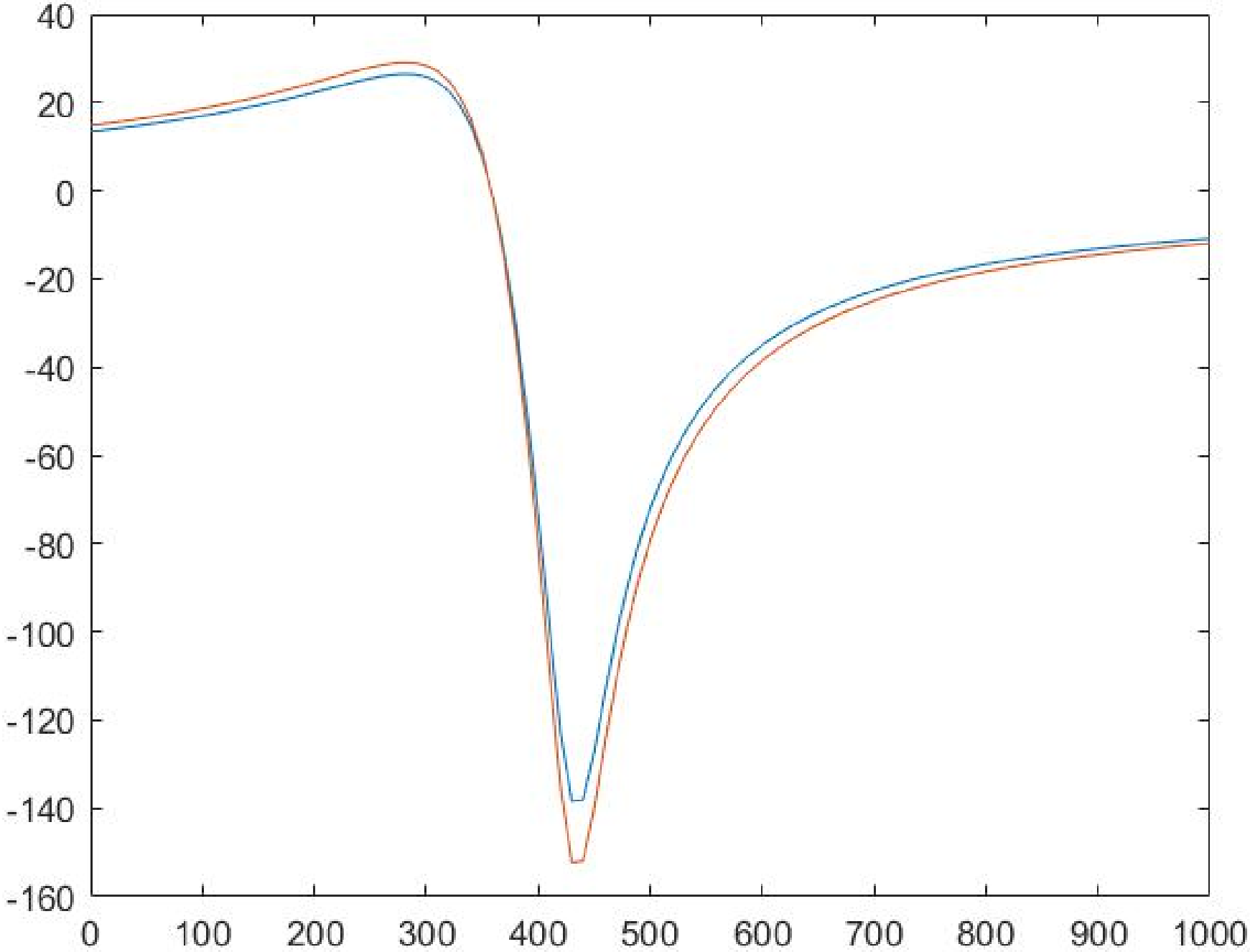
clear all
close all
clc
xi=linspace(0,1000,101);
h=50;
k=50;
a=40;
al=(40*pi)/180;
xo=400;
Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vi)
hold on;
h=50;
k=55;
a=40;
al=(40*pi)/180;
xo=400;
Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vnew)
s=0;
for i = 1:length(xi)
    s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
end
misfiterror=100*((s/length(xi))^0.5)
```

Command Window

```
misfiterror =

    3.6999
```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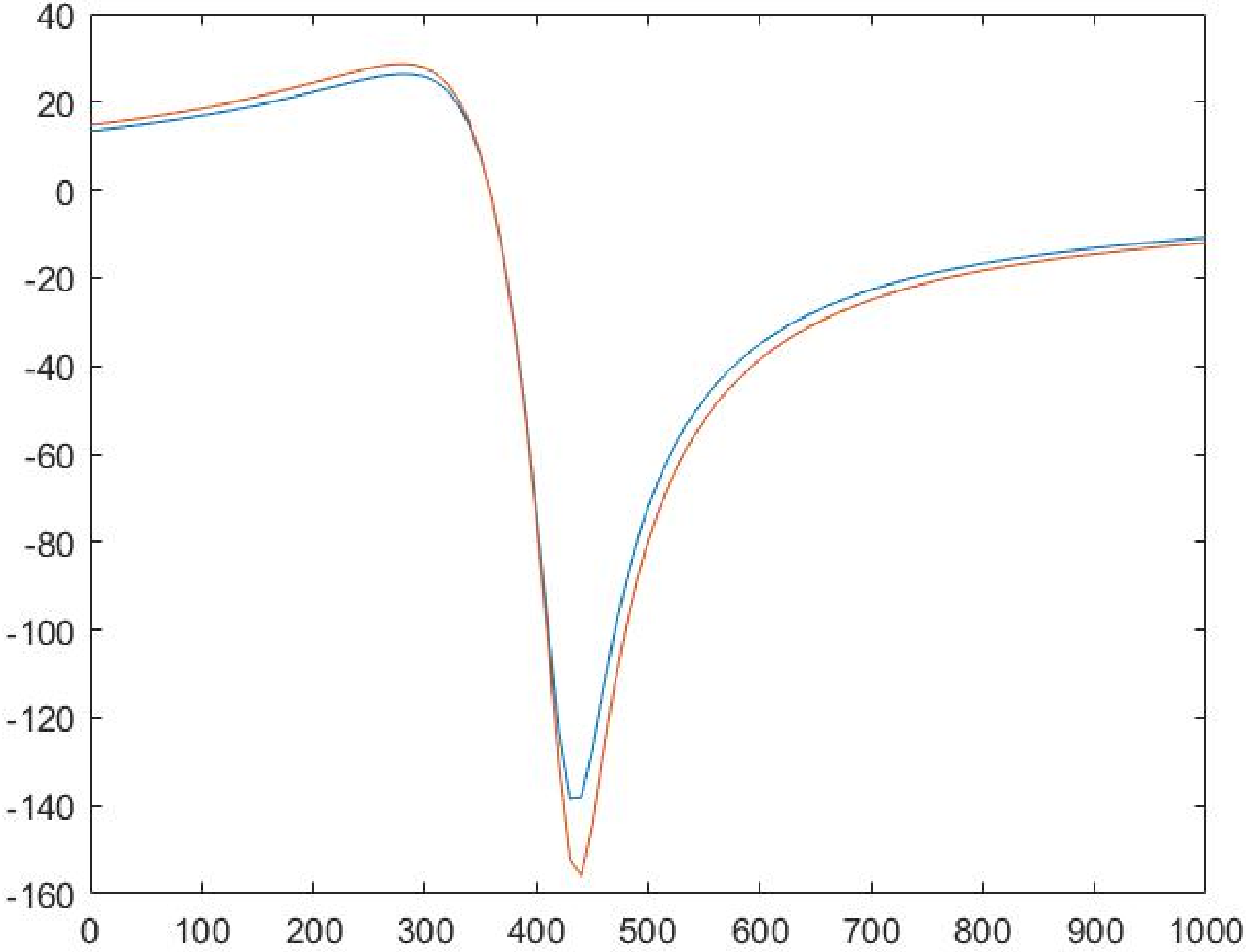
%18EX20030 UTKARSH JAISWAL
clear all
close all
clc
xi=linspace(0,1000,101);
h=50;
k=50;
a=40;
al=(40*pi)/180;
xo=400;
Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vi)
hold on;
h=50;
k=50;
a=44;
al=(40*pi)/180;
xo=400;
Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vnew)
s=0;
for i = 1:length(xi)
    s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
end
misfiterror=100*((s/length(xi))^0.5)
```

Command Window

```
misfiterror =

    3.4705
```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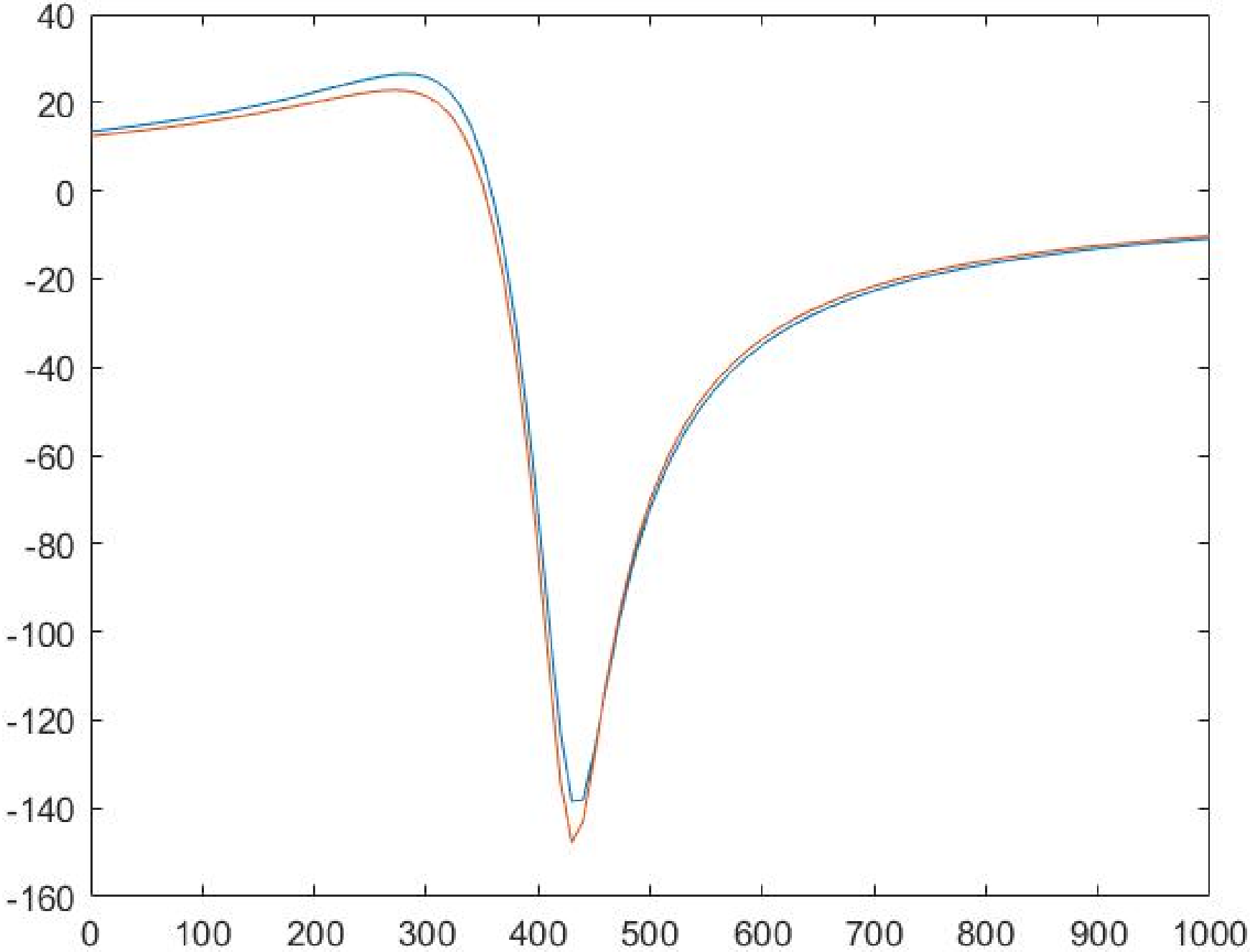
close all
clc
xi=linspace(0,1000,101);
h=50;
k=50;
a=40;
al=(40*pi)/180;
xo=400;
Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vi)
hold on;
h=50;
k=50;
a=40;
al=(40*pi)/180+10/100*(40*pi)/180;
xo=400;
Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vnew)
s=0;
for i = 1:length(xi)
    s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
end
misfiterror=100*((s/length(xi))^0.5)
```

Command Window

```
misfiterror =

   12.8295
```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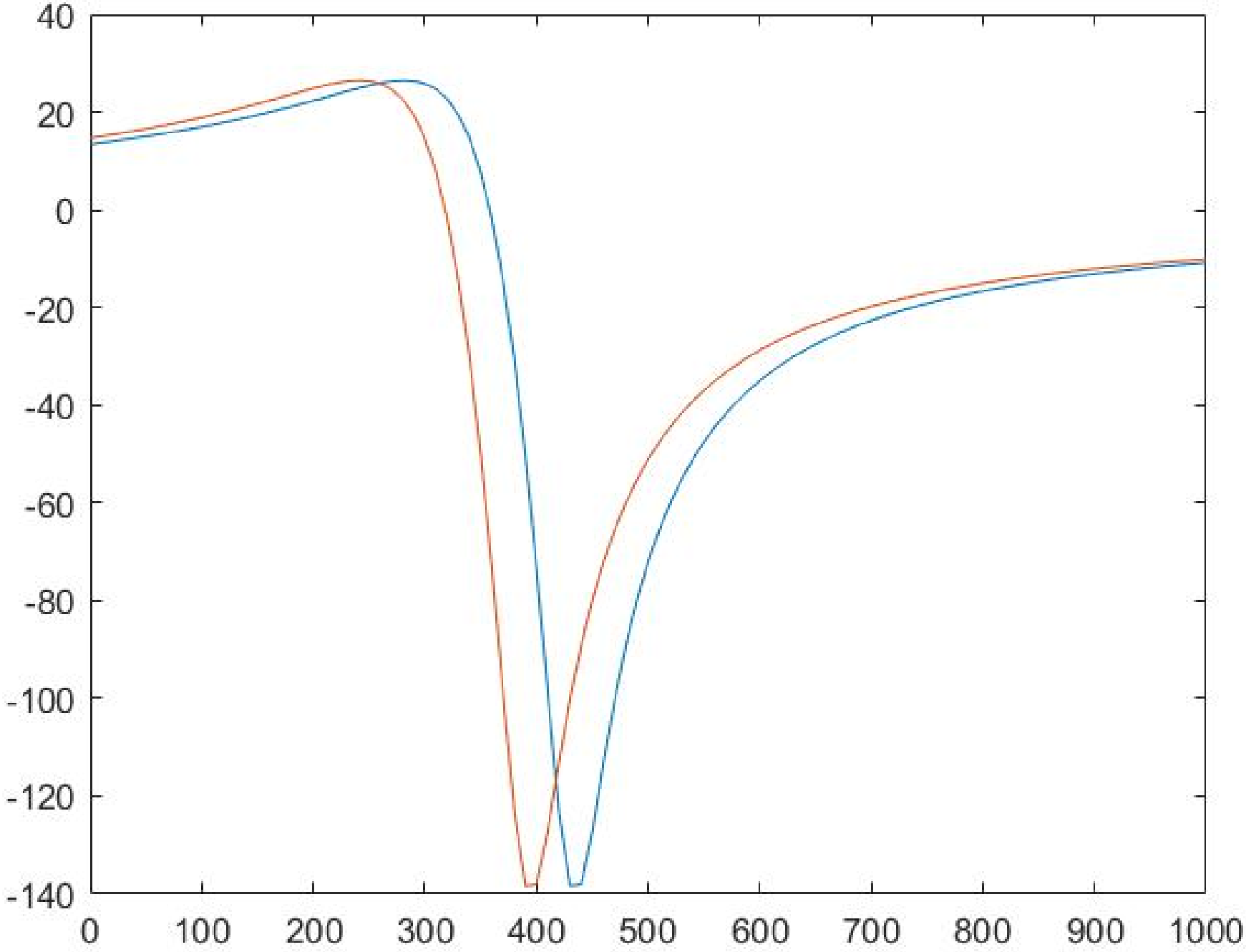
```
%18EX20030 UTKARSH JAISWAL
clear all
close all
clc
xi=linspace(0,1000,101);
h=50;
k=50;
a=40;
al=(40*pi)/180;
xo=400;
Vi=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vi)
hold on;
h=50;
k=50;
a=40;
al=(40*pi)/180;
xo=360;
Vnew=k*log(((((xi-xo)-(a*cos(al))).^2) + ((h-a*sin(al))^2))./((((xi-xo)+(a*cos(al))).^2) + ((h+a*sin(al))^2)));
plot(xi,Vnew)
s=0;
for i = 1:length(xi)
    s=s+((Vi(i)-Vnew(i))/(Vi(i))^2);
end
misfiterror=100*((s/length(xi))^0.5)
```

Command Window

```
misfiterror =

   41.8983
```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Observation:
We observe that except 'h' all other parameters have almost same error so 'h' can be assumed to be the important parameter as it is varying a lot when its value is changed