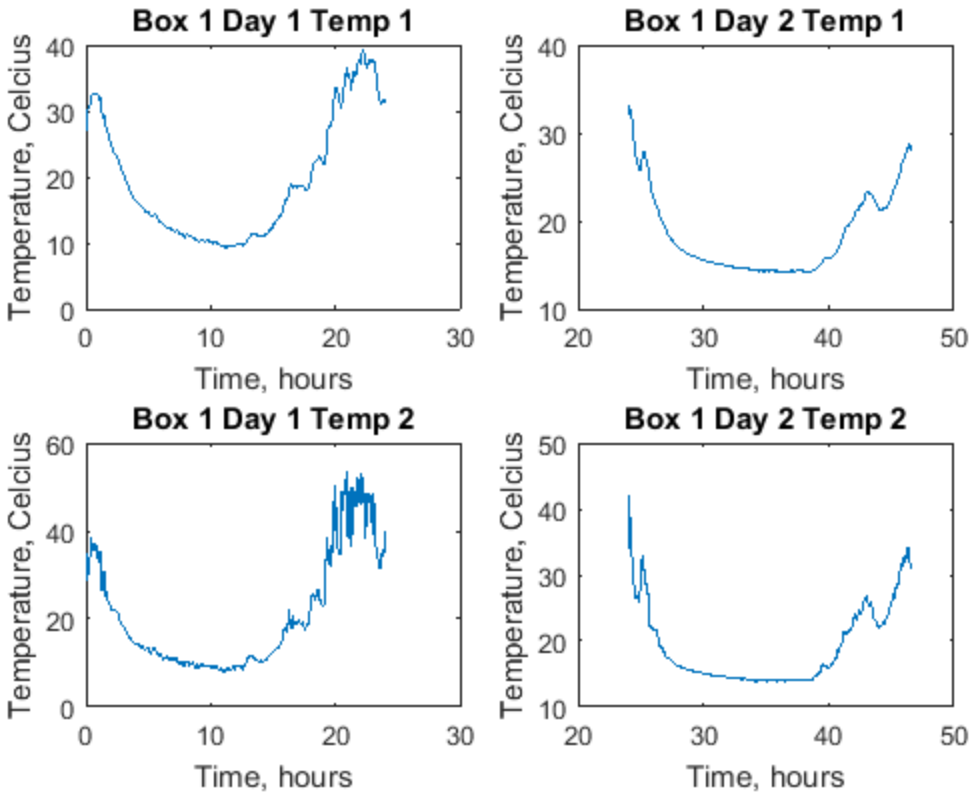
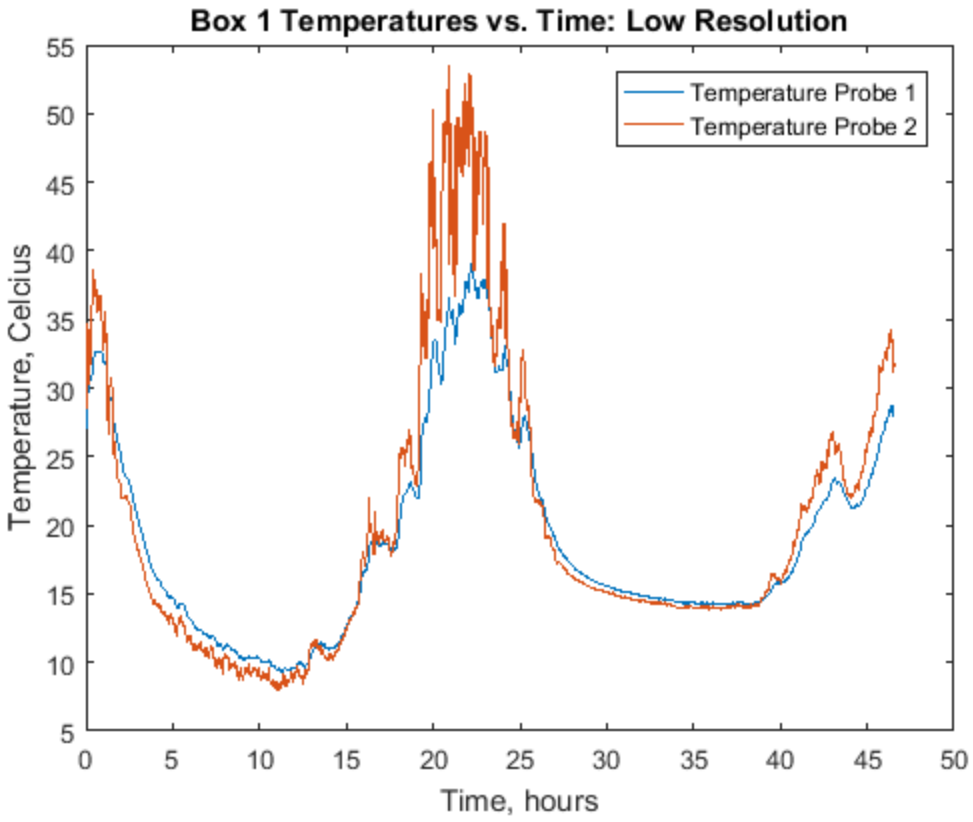
```
%Low Resolution
box1day1time=box1time48(box1time48<=24);
box1day2time=box1time48(box1time48>24);

box1day1temp1=box1temp148(box1time48<=24);
box1day2temp1=box1temp148(box1time48>24);

box1day1temp2=box1temp248(box1time48<=24);
box1day2temp2=box1temp248(box1time48>24);

subplot(2,2,1)
plot(box1day1time,box1day1temp1)
title('Box 1 Day 1 Temp 1'), xlabel('Time,
 hours'),ylabel('Temperature, Celcius')

subplot(2,2,2)
plot(box1day2time, box1day2temp1)
title('Box 1 Day 2 Temp 1'), xlabel('Time,
 hours'),ylabel('Temperature, Celcius')

subplot(2,2,3)
plot(box1day1time,box1day1temp2)
title('Box 1 Day 1 Temp 2'), xlabel('Time,
 hours'),ylabel('Temperature, Celcius')

subplot(2,2,4)
plot(box1day2time, box1day2temp2)
title('Box 1 Day 2 Temp 2'), xlabel('Time,
 hours'),ylabel('Temperature, Celcius')

box1day1maxtemp1=max(box1day1temp1);
box1day1mintemp1=min(box1day1temp1);
box1day1maxtemp2=max(box1day1temp2);
box1day1mintemp2=min(box1day1temp2);
box1day2maxtemp1=max(box1day2temp1);
box1day2mintemp1=min(box1day2temp1);
box1day2maxtemp2=max(box1day2temp2);
box1day2mintemp2=min(box1day2temp2);

box1avgtemps=(box1temp148+box1temp248)/2;
box1day1avgtemps=box1avgtemps(box1time48<=24);
box1day2avgtemps=box1avgtemps(box1time48>24);
```




```
subplot(1,1,1)
plot(box1time48,box1temp148,box1time48,box1temp248)
title('Box 1 Temperatures vs. Time: Low Resolution'),xlabel('Time,
 hours'),ylabel('Temperature, Celcius')
legend('Temperature Probe 1','Temperature Probe 2')
```

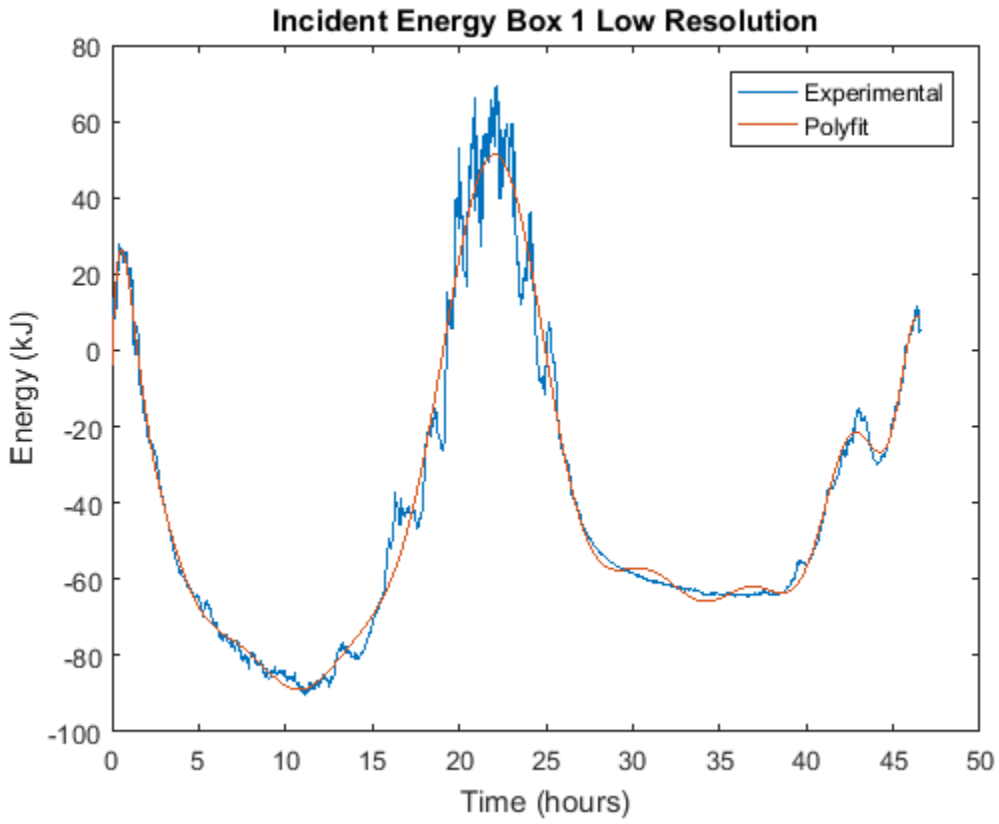


Incident Energy Low-Resolution Box 1

```
%Using measurements of length, width, and height, and multiplying by
%0.0254^3 to convert to meters
volume1=21*24*24*(0.0254^3);

%The density of air is dependent on the temperature. I interpolated
 data
%from engineeringtoolbox.com to find the densities at various
 temperatures
densitydatatemps=[-40 -20 0 5 10 15 20 25 30 40 50 60 70 80 90 100 200
 300 400 500 1000];
densitydata=[1.514 1.395 1.293 1.269 1.247 1.225 1.204 1.184 1.165
 1.127 1.109 1.060 1.029 0.9996 0.9721 0.9461 0.7461 0.6159 0.5243
 0.4565 0.2772];

expdensity1=interp1(densitydatatemps,densitydata,box1avgtemps,'spline');

%The specific heat for air at constant volume is 0.718 kJ/kg*K
c=0.718;

%Mass of air in the box is density over volume
mair1=expdensity1./volume1;

%Temperature change
```

```
tempchange1=box1avgtemps-box1avgtemps(1);

%Energy
q1=mair1.*c.*tempchange1;

plot(box1time48,q1)
title('Incident Energy Box 1 Low Resolution'),xlabel('Time
 (hours)'),ylabel('Energy (kJ)')
hold on

polyn1=polyval(polyfit(box1time48,q1,20),box1time48);
plot(box1time48,polyn1)
legend('Experimental','Polyfit')
```

```
Warning: Polynomial is badly conditioned. Add points with distinct X
 values,
reduce the degree of the polynomial, or try centering and scaling as
described in HELP POLYFIT.
```



High Resolution

```
box1avghr=(box1temp1+box1temp2)/2;
box1_1hr_maxtemp=max(box1avghr)
box1_1hr_mintemp=min(box1avghr)
```

```
box1_1hr_maxtemp =

   45.6022

box1_1hr_mintemp =

   39.8333
```

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