

Solutions for ME6130 - Lab Tutorial

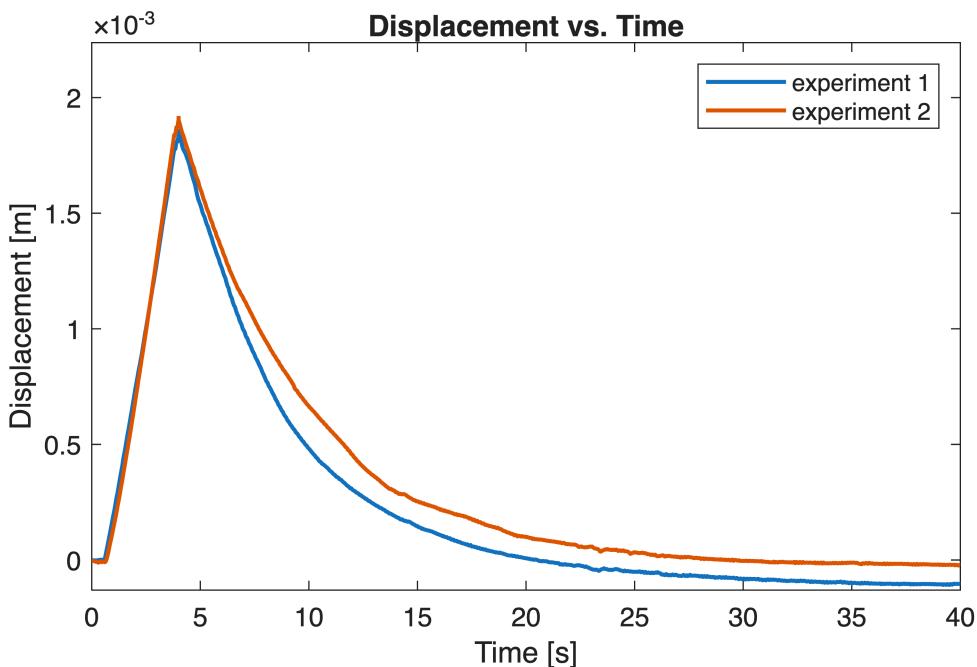
The Carbon Fiber (CF) TCAM modelling and Simulation work

```
clear all; close all;
MaterialType = 'CF';      % or 'Nylon'
loadTCAMParameters(MaterialType);
```

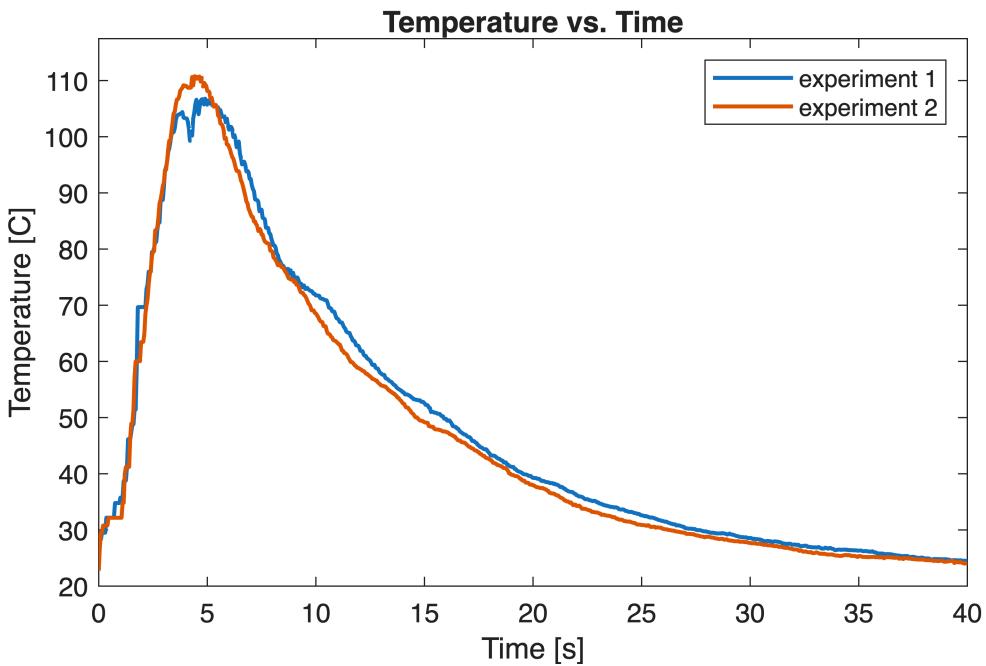
✓ Parameters loaded for CF

Plot the CF experimental results

```
fig1 = figure(1);
plot(Time,Disp, '- ', LineWidth=1.5)
legend('experiment 1','experiment 2')
xlabel('Time [s]')
ylabel('Displacement [m]')
ylim([min(Disp(:,1))*1.2 max(Disp(:,1))*1.2])
title('Displacement vs. Time')
```



```
fig2 = figure(2);
plot(Time,Temp, '- ', LineWidth=1.5)
legend('experiment 1','experiment 2')
xlabel('Time [s]')
ylabel('Temperature [C]')
ylim([20 max(Temp(:,1))*1.1])
title('Temperature vs. Time')
```



Generate the Simulated plots for CF

```
out = sim('Sim_model_LS.slx')
```

```
out =
Simulink.SimulationOutput:
    simout: [1x1 timeseries]
    tout: [80x1 double]
    SimulationMetadata: [1x1 Simulink.SimulationMetadata]
    ErrorMessage: [0x0 char]
```

Plot both simulated and experimental results on the same plot for CF

```
plotTCAMResults();
```

The Nylon TCAM modelling and Simulation work

```
clear all; close all;
MaterialType = 'Nylon';      % or 'Nylon'
loadTCAMParameters(MaterialType);
```

✓ Parameters loaded for Nylon

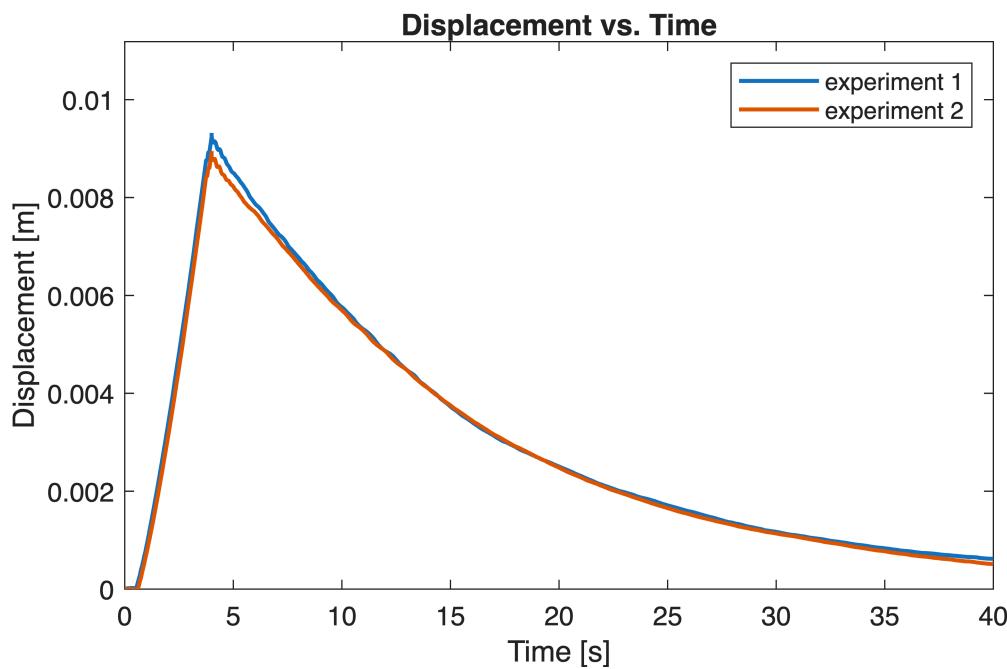
Plot the Nylon experimental results

```
fig1 = figure(1);
plot(Time,Disp,'-',LineWidth=1.5)
legend('experiment 1','experiment 2')
xlabel('Time [s]')
```

```

ylabel('Displacement [m]')
ylim([min(Disp(:,1))*1.2 max(Disp(:,1))*1.2])
title('Displacement vs. Time')

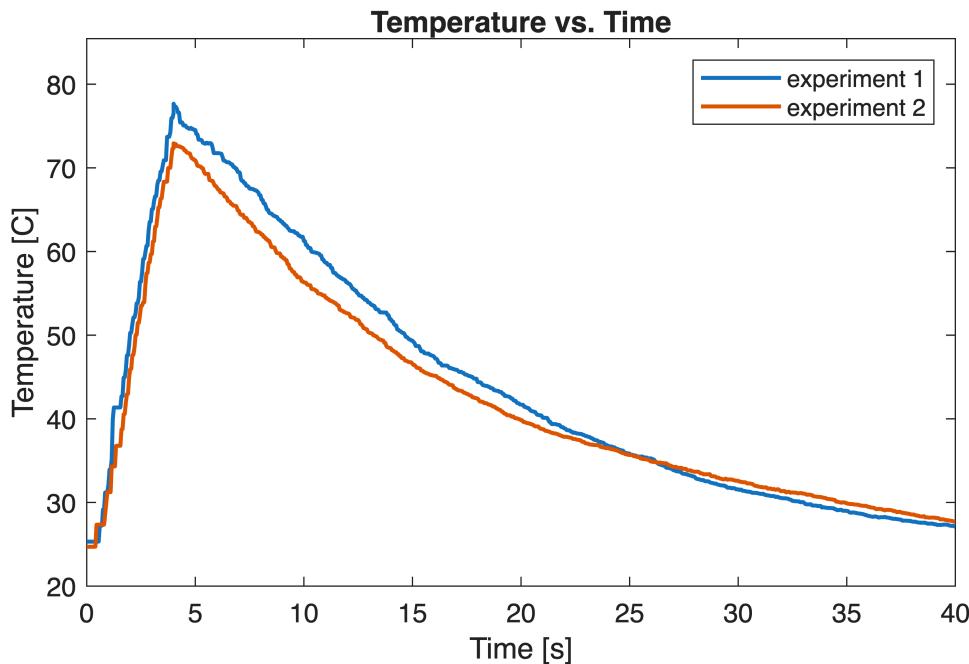
```



```

fig2 = figure(2);
plot(Time,Temp, '- ', LineWidth=1.5)
legend('experiment 1','experiment 2')
xlabel('Time [s]')
ylabel('Temperature [C]')
ylim([20 max(Temp(:,1))*1.1])
title('Temperature vs. Time')

```



Generate the Simulated plots for Nylon

```
out = sim('Sim_model_LS.slx')
```

```
out =
Simulink.SimulationOutput:
    simout: [1x1 timeseries]
    tout: [801x1 double]
SimulationMetadata: [1x1 Simulink.SimulationMetadata]
ErrorMessage: [0x0 char]
```

Plot both simulated and experimental results on the same plot for Nylon

```
plotTCAMResults();
```

