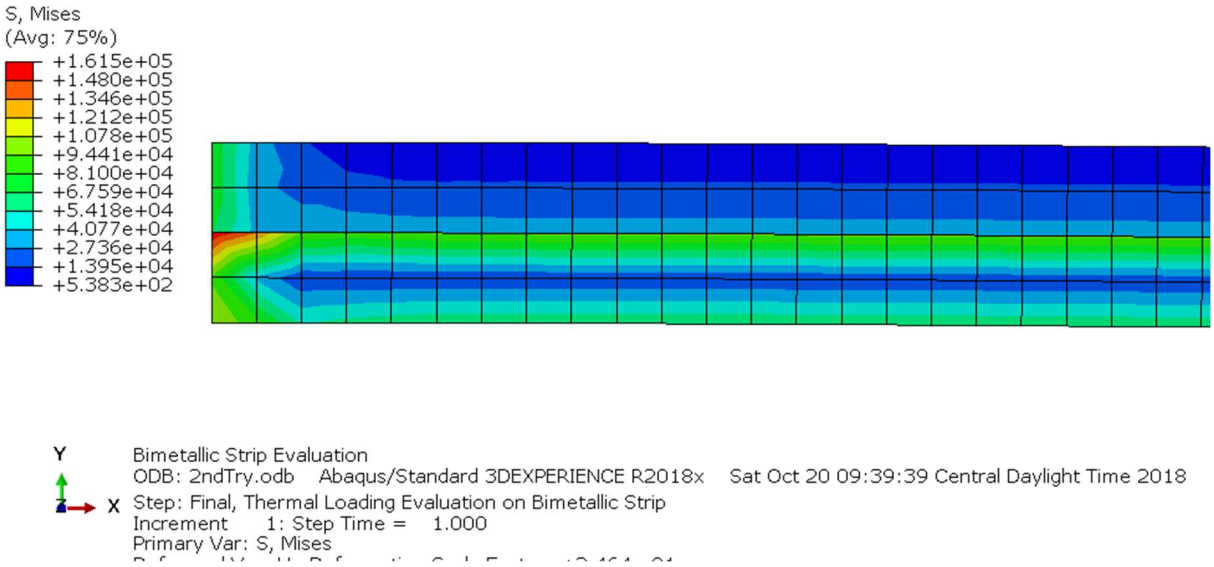
CLAY FREEMAN

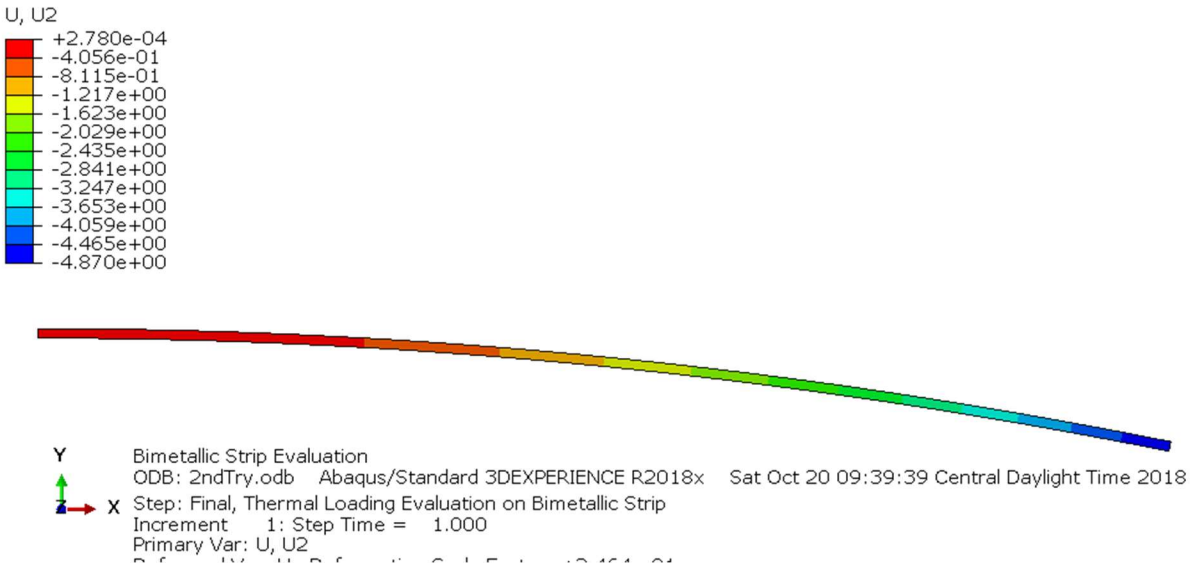
ME 486 : FINITE ELEMENT ANALYSIS

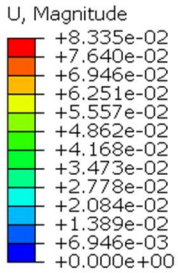
J. MAHONEY – FALL 2018

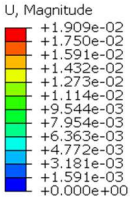
FEM 006 BIMETALLIC STRIP

22 OCTOBER, 2018


S, Mises
(Avg: 75%)
+1.615e+05
+1.480e+05
+1.346e+05
+1.212e+05
+1.078e+05
+9.441e+04
+8.100e+04
+6.759e+04
+5.418e+04
+4.077e+04
+2.736e+04
+1.395e+04
+5.383e+02
Y
X
Bimetallic Strip Evaluation
ODB: 2ndTry.odb Abaqus/Standard 3DEXPERIENCE R2018x Sat Oct 20 09:39:39 Central Daylight Time 2018
Step: Final, Thermal Loading Evaluation on Bimetallic Strip
Increment 1: Step Time = 1.000
Primary Var: S, Mises


U, U2
+2.780e-04
-4.056e-01
-8.115e-01
-1.217e+00
-1.623e+00
-2.029e+00
-2.435e+00
-2.841e+00
-3.247e+00
-3.653e+00
-4.059e+00
-4.465e+00
-4.870e+00
Y
X
Bimetallic Strip Evaluation
ODB: 2ndTry.odb Abaqus/Standard 3DEXPERIENCE R2018x Sat Oct 20 09:39:39 Central Daylight Time 2018
Step: Final, Thermal Loading Evaluation on Bimetallic Strip
Increment 1: Step Time = 1.000
Primary Var: U, U2






```
>>> t_0 = 70
>>> t_f = 600
>>> a_Mo = 3.0e-6
>>> a_Al = 13.1e-6
>>> E_Mo = 48.0e6
>>> E_Al = 10.0e6
>>> v_Mo = 0.34
>>> v_Al = 0.30
>>> dL = a_Al*(t_f - t_0)*12
>>> dL
0.083316
>>> area_bar = (0.1*1) # Area of moly bar
>>> dL_Mo = a_Mo*(t_f - t_0)*12
>>> dL_Mo
0.01908
>>> p_bar = area_bar*E_Mo*dL_Mo
>>> p_bar
91584.0
```