

#1302: OptiStruct – NLTRANS heat transfer with temp-dependent conductivity

Product: OptiStruct

Product Version: OptiStruct 2017.2.2 or above

Topic Objective

NLTRANS heat transfer with temp-dependent conductivity in OptiStruct.

Topic Detail

Nonlinear transient heat transfer analysis is supported in OptiStruct from v2017.2.2

The basic equation for transient heat transfer analysis is

- $C\dot{T} + [K + H]T = f$, where C is heat capacity matrix and K is conductivity matrix

When the conductivity matrix becomes temperature dependent, then it is nonlinear transient heat transfer analysis.

Now, temp-dependent conductivity table can be specified to perform transient heat transfer analysis.

Example problem: NLTRANS Heat Transfer of exhaust manifold with temp-dependent conductivity

```

MAT4          2  0.045          7.8-6  0.0005
MAT4          2  5
TABLEM1      5
+             0.0  0.003  100.0  0.006  200.0  0.008  300.0  0.01
+             400.0  0.013  500.0  0.0155  600.0  0.018  700.0  0.022
+             ENDT
    
```

