#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
MATT4           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
```