#1287: OptiStruct – Why use Super elements?

Product: OptiStruct
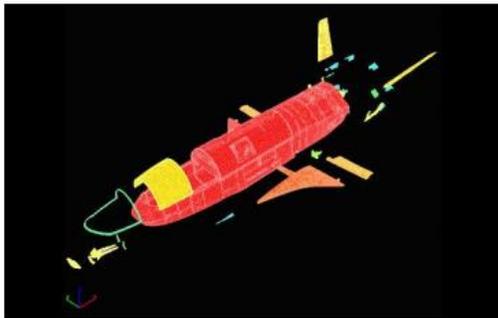**Product Version**: OptiStruct 12.0 or above

Topic Objective
Use of superelements in OptiStruct.

Topic Details

Reduced Cost

Instead of solving the entire model each time, super elements offer the advantage of incremental processing. Computer performance can increase 2 to 30 times faster than non-super elements methods.


Reduced risk

Processing a model without using super elements is an all-or-nothing proposition. If an error occurs, the entire model must be processed again until error is corrected. When using super elements, each super element need be processed only once, unless a change requires reprocessing the super element. If an error occurs during processing, only the affected super element and the residual structure (final super element to be processed) need be reprocessed.

Large problem capabilities

A model size is limited only by hardware capabilities. Using super elements, we can reduce model sizes in terms of DOF, hence, large models can be easily run in Workstations.
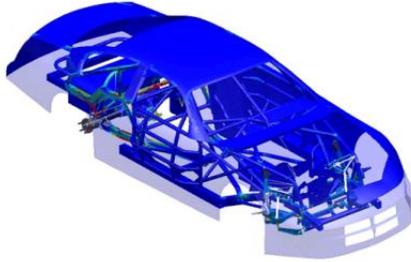
Partitioned I/O
Because super elements can be processed individually, separate analysis groups can model individual parts of the structure and perform checks and assembly analysis without information from other groups.

Security
Many companies work on proprietary or secure projects. These may range from keeping a new design from the competition to working on a highly confidential defense program. Even when working on secure programs, there is a need to send a representation of the model to others so that they may perform a coupled analysis of an assembly which incorporates the component. The use of external super elements allows users to send reduced boundary matrices that contain no geometric information about the actual component-only mass, stiffness, damping and loads as seen at the boundary.