SMA PASSIVE SHOCK ABSORBER

PROBLEM STATEMENT
To design a passive shock absorber that incorporates Nitinol™ as damping material to effectively attenuate and dissipate a range of mechanical vibrations by means of thermal control.

MOTIVATION
- The need of a suspension system for Florida International University Formula Society of Automotive Engineers (SAE)

OBJECTIVES
- Prototype a shock absorber with variable damping ratios.
- Implement a thermal delivery system to regulate the temperature
- Effectively attenuate high amplitude Vibrations

CONCEPTUAL GEOMETRY

MATERIAL BEHAVIOR

PROPOSED DESIGN
- A shock absorber constructed with Nitinol springs that undergoe phase transformation at controlled temperatures in order to changes the system's characteristics.

ANALYSIS
- FEA simulation in Solidworks™ using the built-in SMA material model:

TIMELINE

TEAM MEMBERS
- Harold Hastings
- Alexander Zuleta

Advis: Dr. Munroe

To construct and conduct assessments of a working prototype for measuring its transmissibility over different input frequency.

To test for fatigue using Solidworks™ simulation tool.