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Title: Evaluating the Effect of Shaker Placement Optimization Priorities on Multi-Axis Test Results

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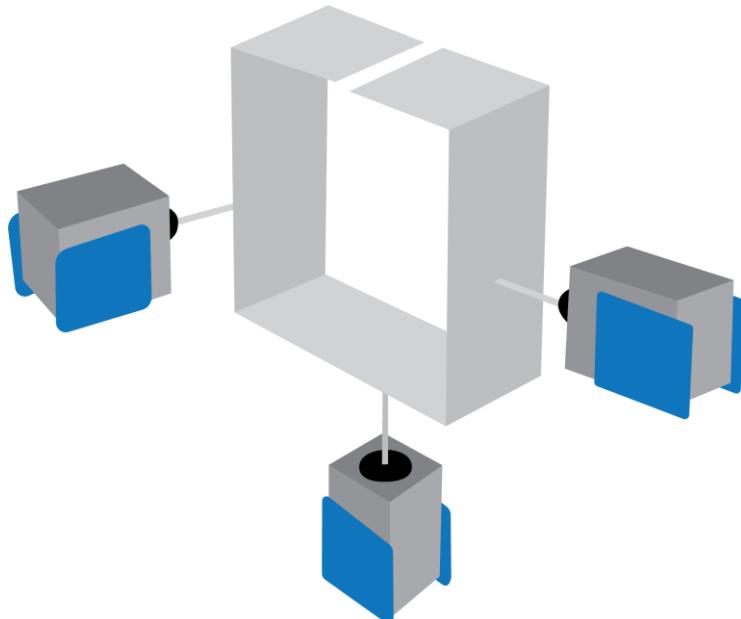
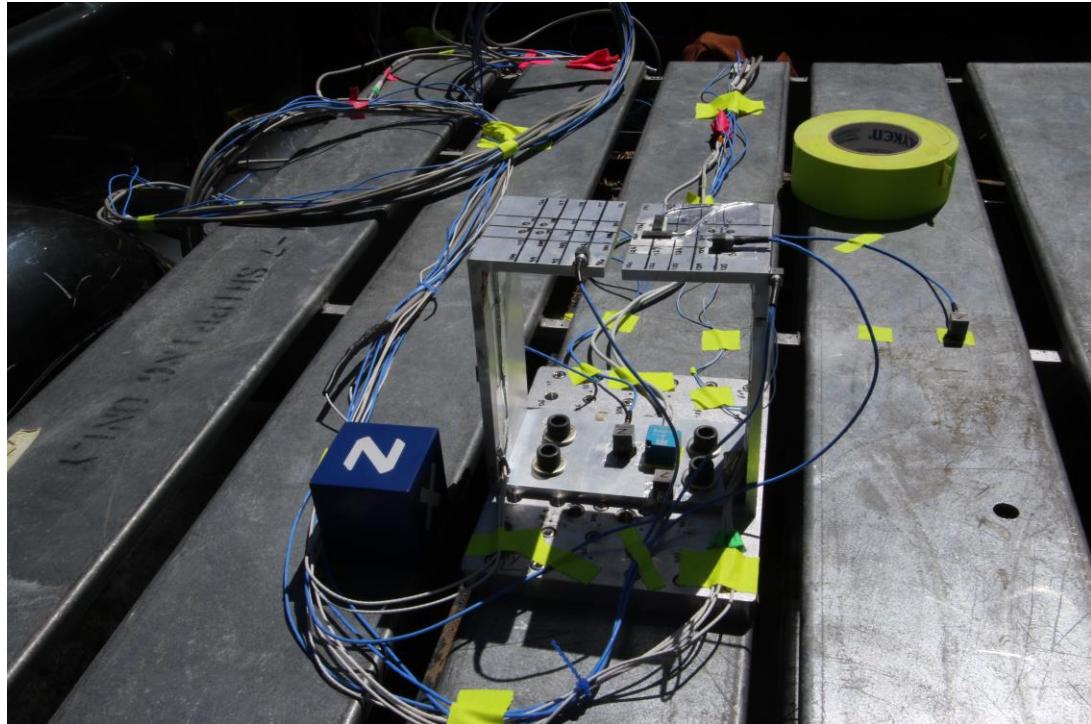
Evaluating the Effect of Shaker Placement Optimization Priorities on Multi-Axis Test Results

Students: Risto Djishev, Kieran Elrod, Connor Tasik

Mentors: Shannon Danforth, Jim DeClerck, Brittany Ouellette, John Schultze

June 26, 2024

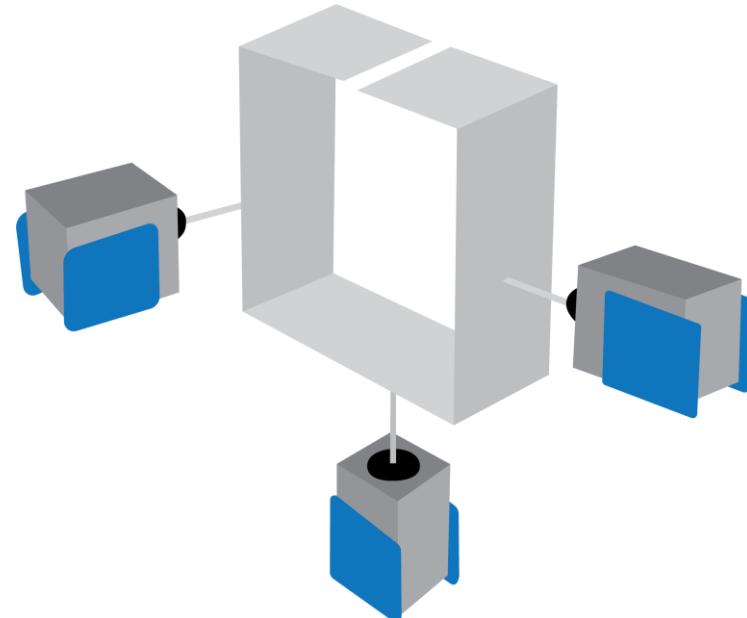
Multi-axis tests can better emulate field environments, but determining shaker placement is difficult.



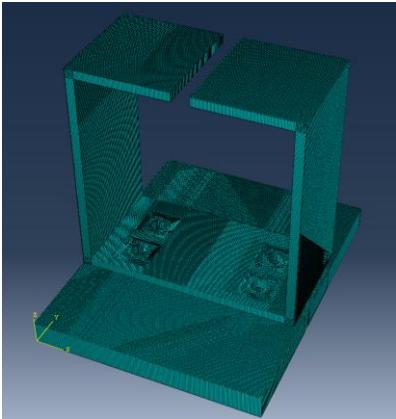
Optimization algorithms are a good way to select shaker locations and directions.

A shaker placement optimization looks like:

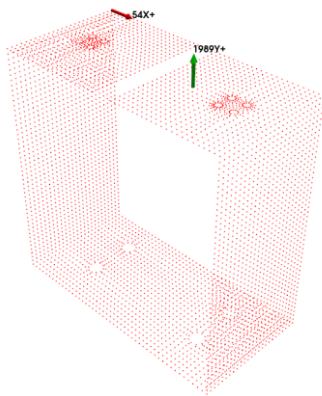
- Choose the **shaker degrees of freedom**
 - Location and direction
- To **minimize some cost**
 - E.g., error between field and test data
- While **satisfying some constraints**
 - E.g., keep shaker force below a threshold



This project evaluates how test results reflect optimization cost and constraints.



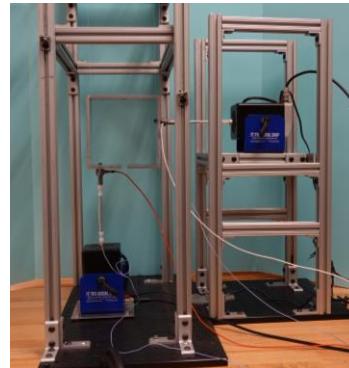
SDynPy



Create and calibrate a finite element analysis model.

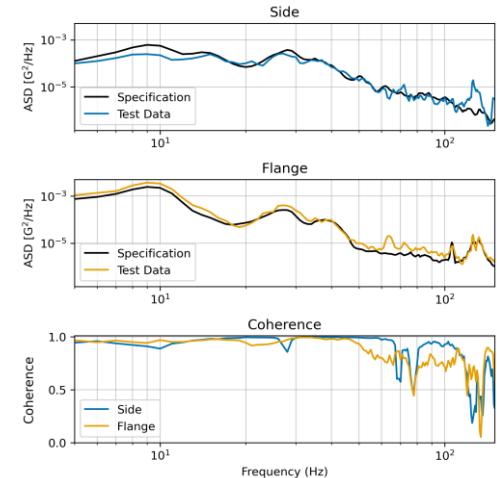
Rattlesnake
Vibration Controller

Sandia National Laboratories python powered



Use the SDynPy Python toolbox to optimize shaker placement.

Run tests with optimization results.



Analyze: Do test data reflect our optimization cost/constraints?