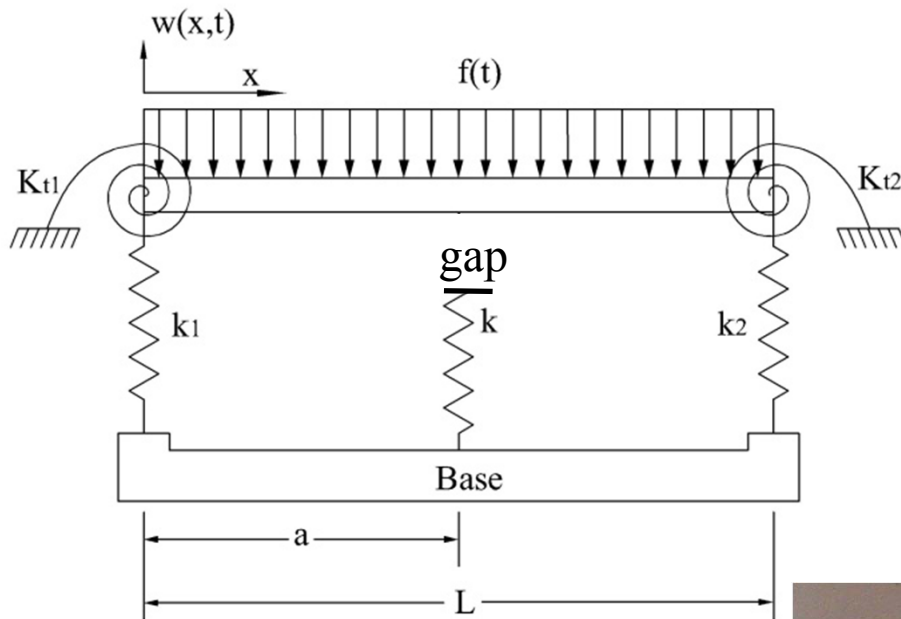


## Numerical Model

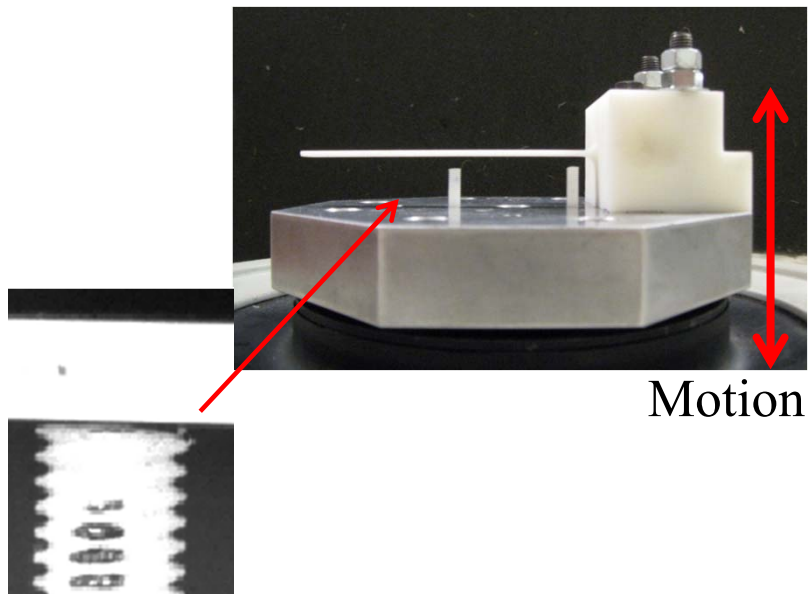
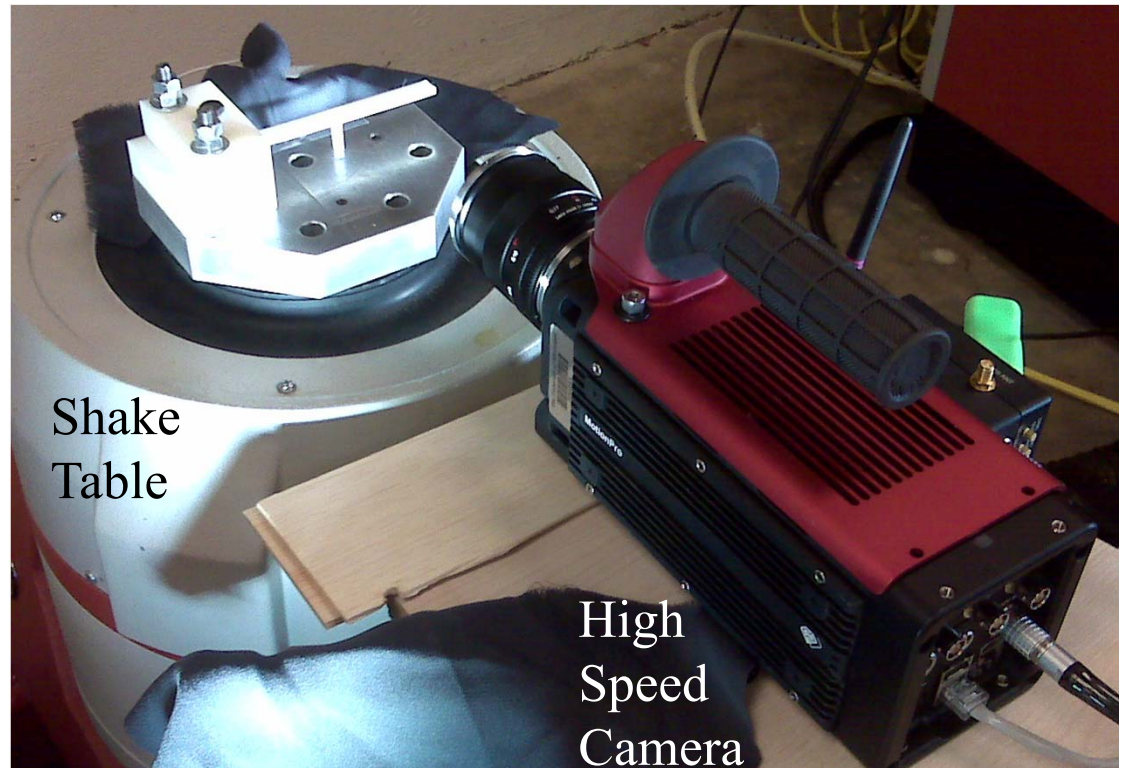


Fixed-Free Beam

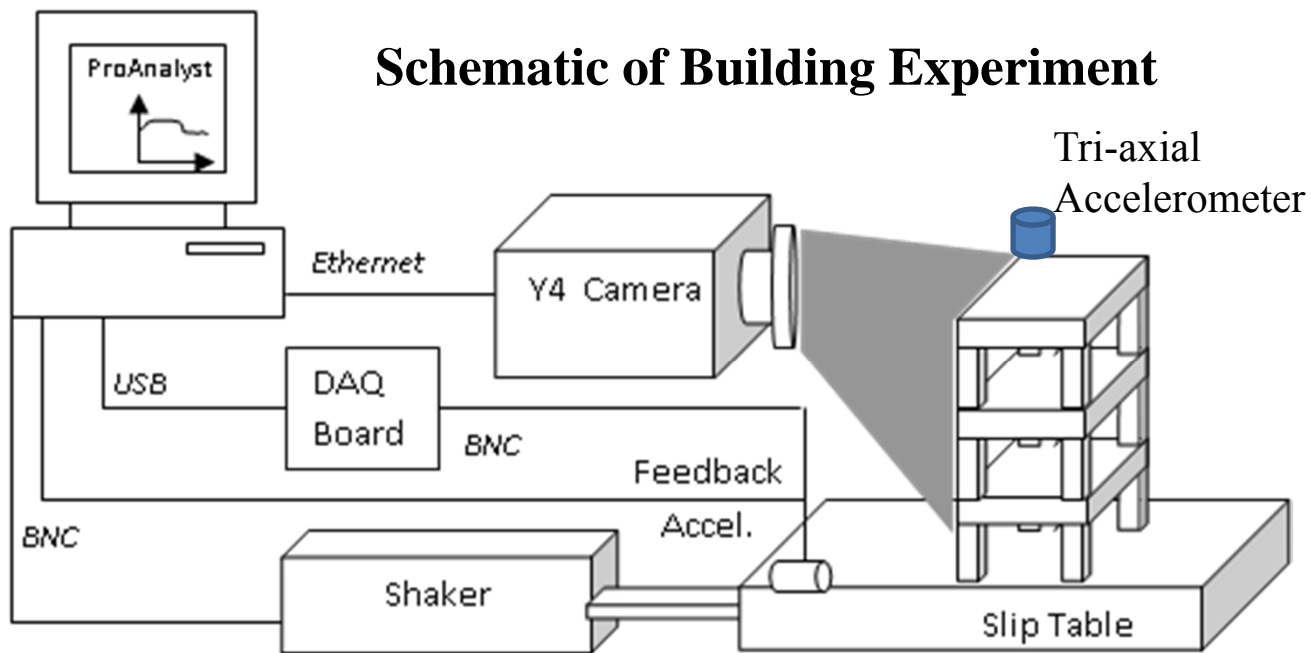
$$K_{t1} = k_1 = \infty$$

$$K_{t2} = k_2 = 0$$

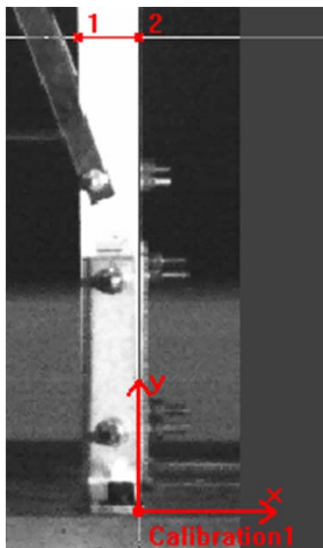
## Experimental Study



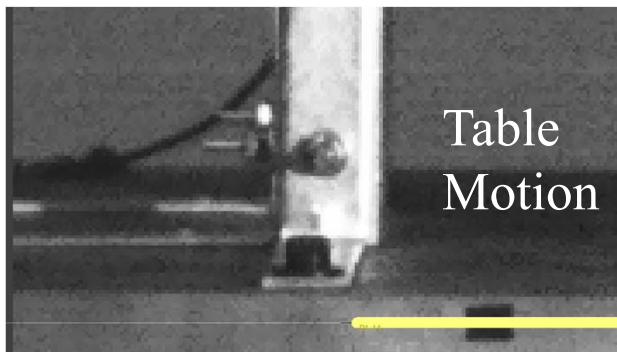
## Schematic of Building Experiment



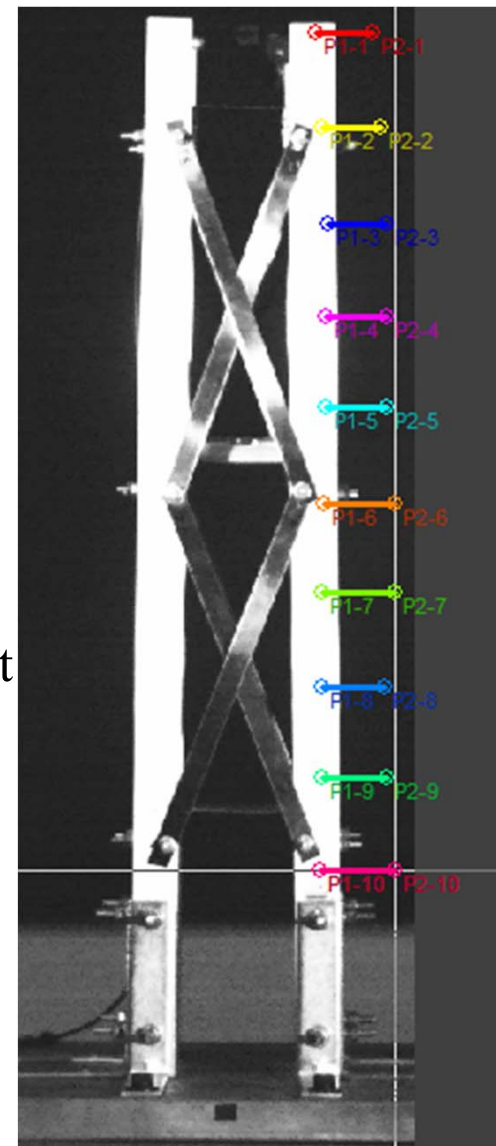
## Xcitex ProAnalyst Post-Processing



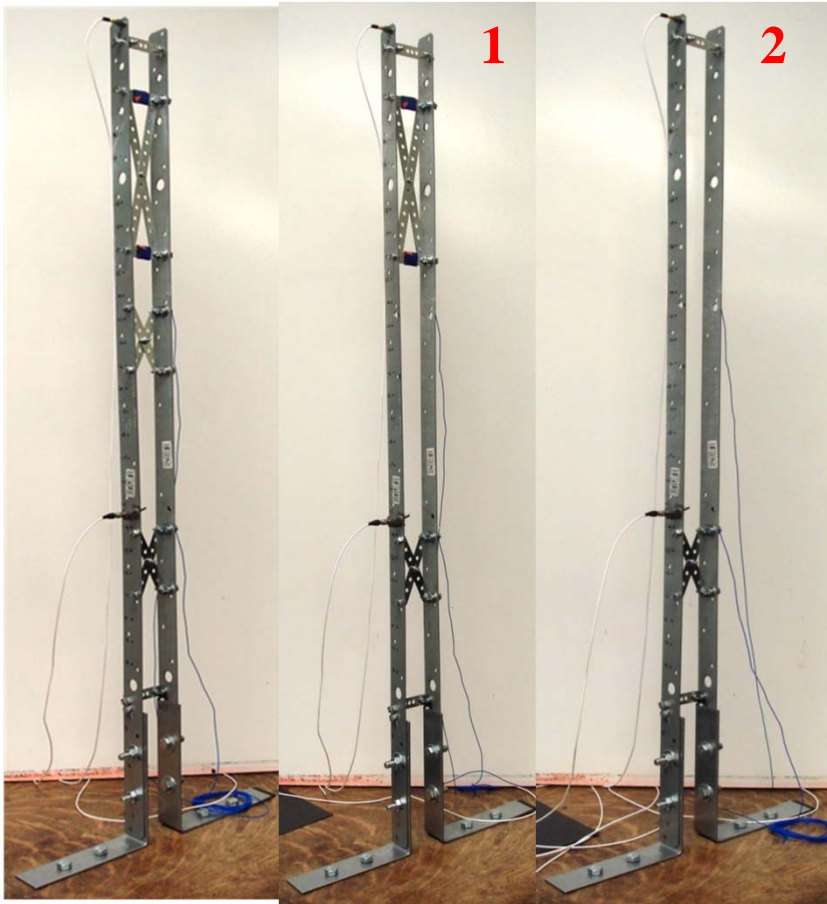
Calibration



Edge Detection for Displacement



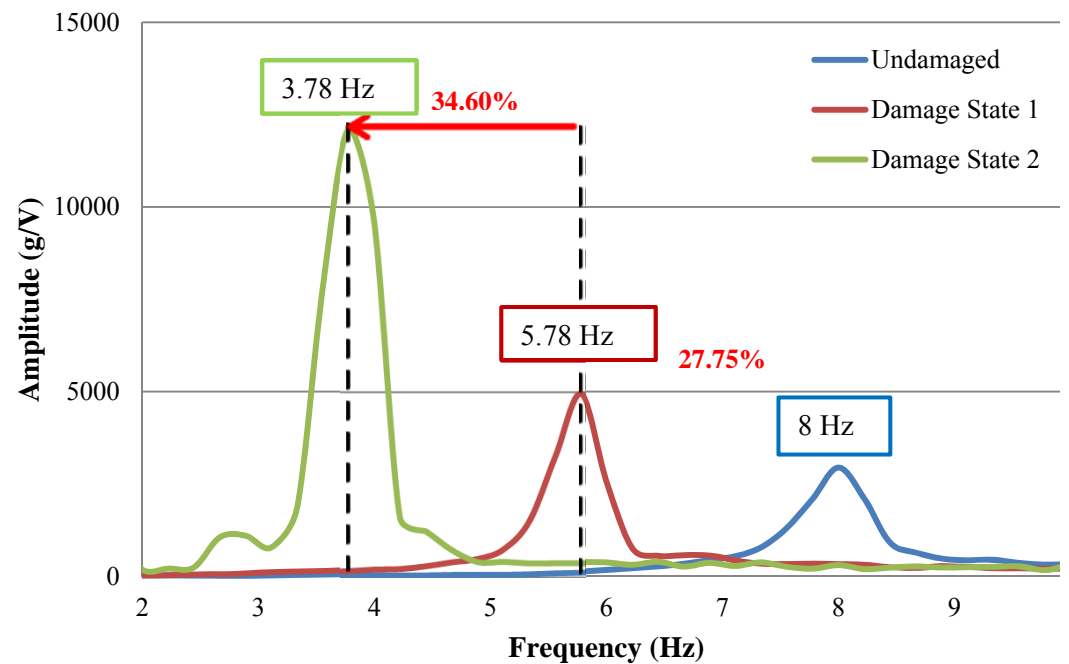
# Incrementally Damaged Tower: Experimental Series 1



Increasing Damage by Removing Bracing

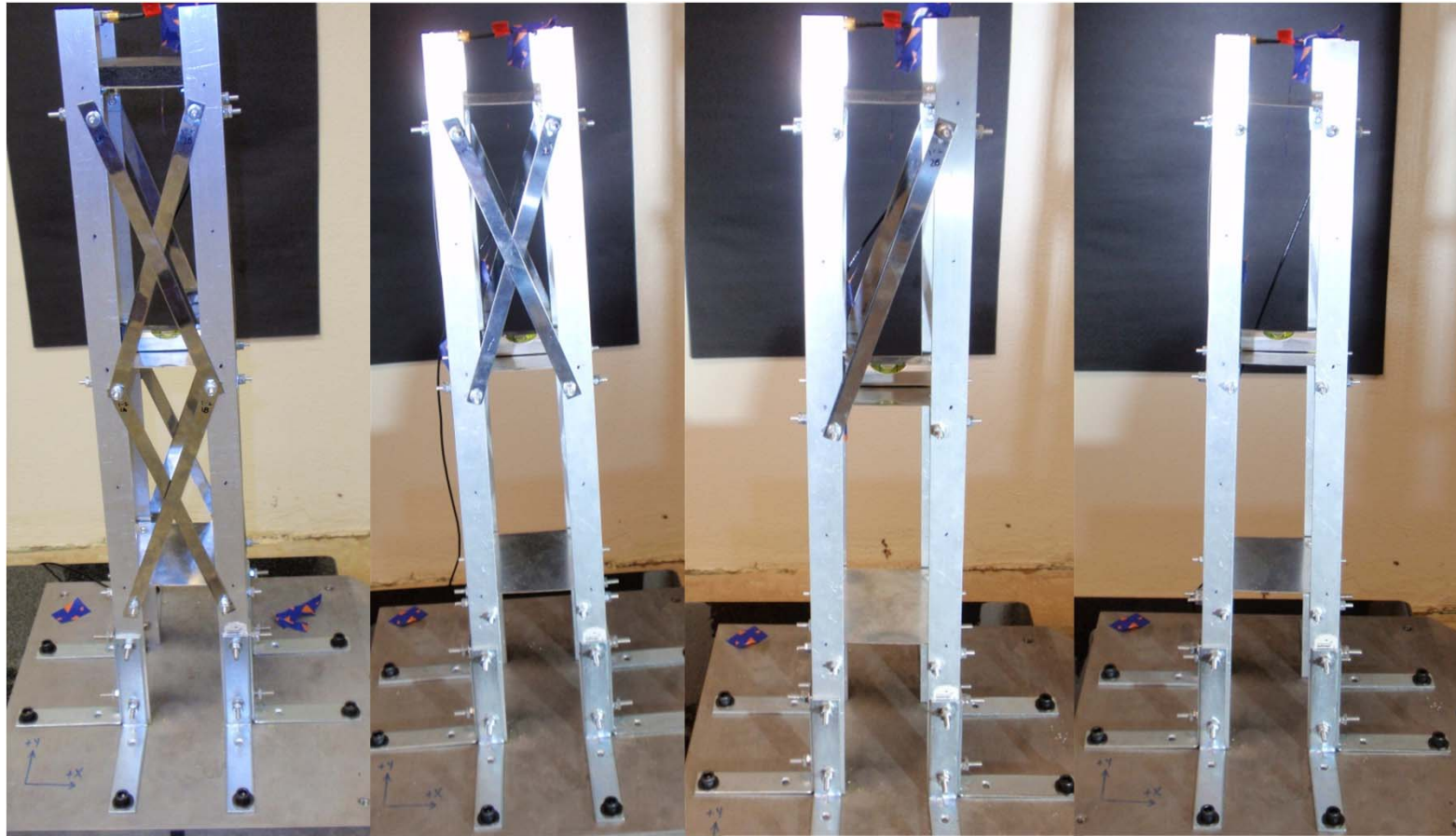
## Results

- Decreasing frequency
- Increasing displacement
- Consistent with decreasing stiffness





## Incrementally Damaged Building: Experimental Series 2

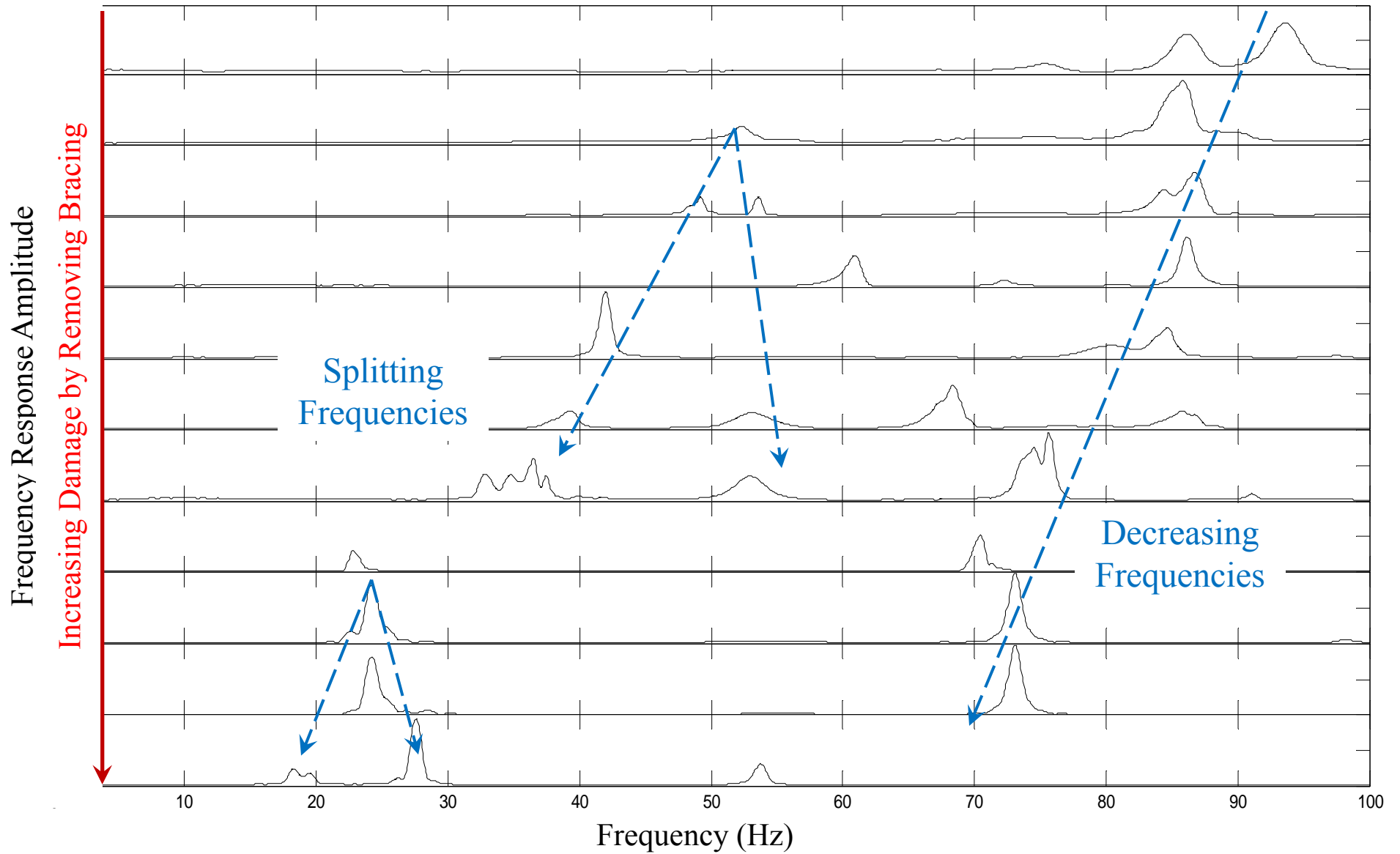


Increasing Damage by Removing Bracing

10 Damage Cases, 4 Reinforced Cases; Both modal tap tests and shake tests.

# Experimental Series 2 Results

Obtained Modal Peaks from STAR Modal using tap test data



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[The Multi-Function Dynamics Laboratory](#)