

SEI Structures Congress
Long Beach, CA
May 2007

Interpretation of nonstructural component fragility data

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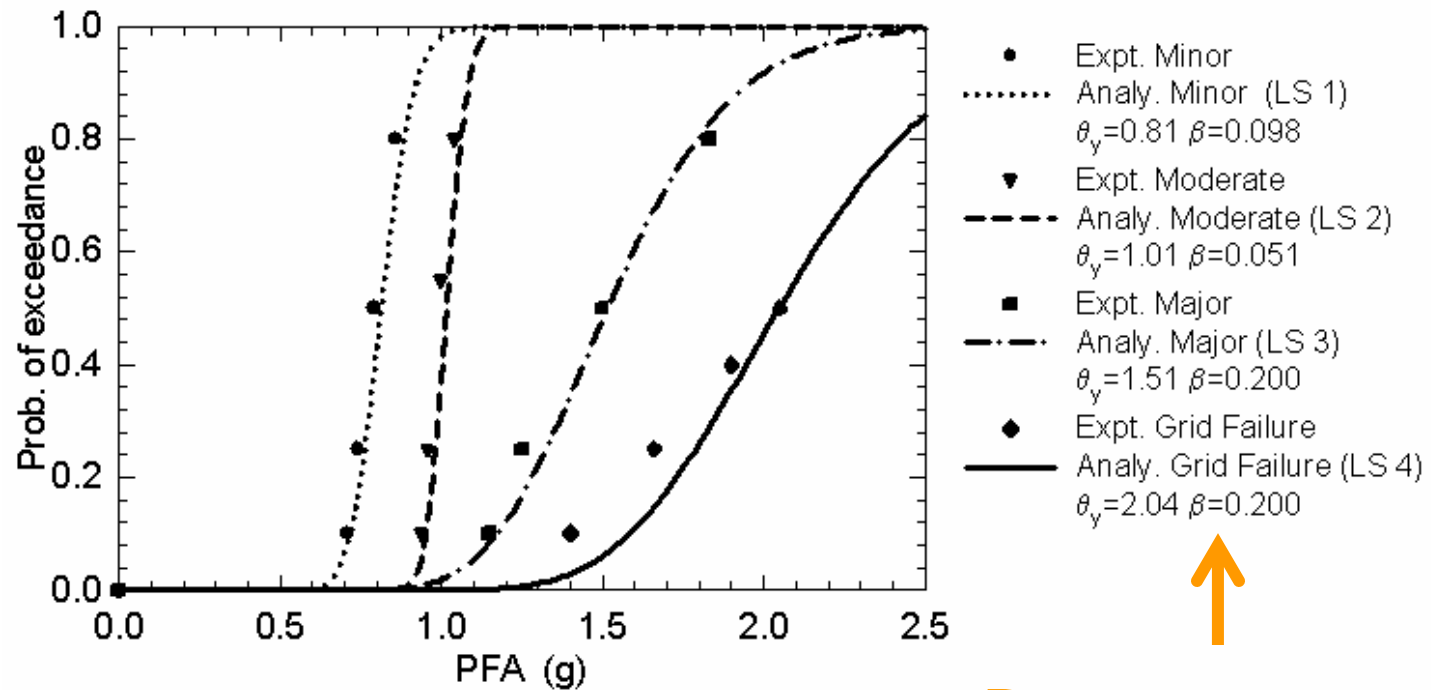


Fragility data

- Generated for the purpose of relating **damage states** to **demand parameters** that can be quantified by analysis
- Test fixture
 - Simulates typical in-service conditions?
 - Loading environment?
- Damage states
 - Defined as?
 - Occupancy dependent
 - Minimum of two
- Demand parameters
 - Deformations
 - Accelerations
 - Velocities
 - Combination of parameters and directions (2H, 1V)



Fragility curves

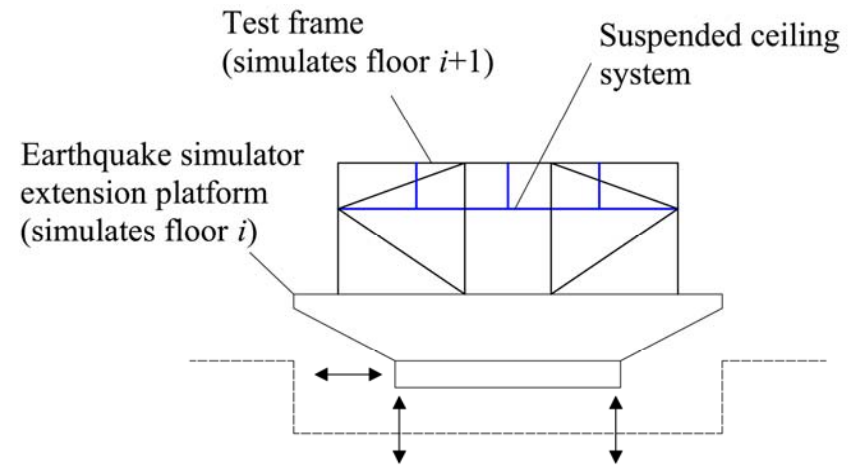
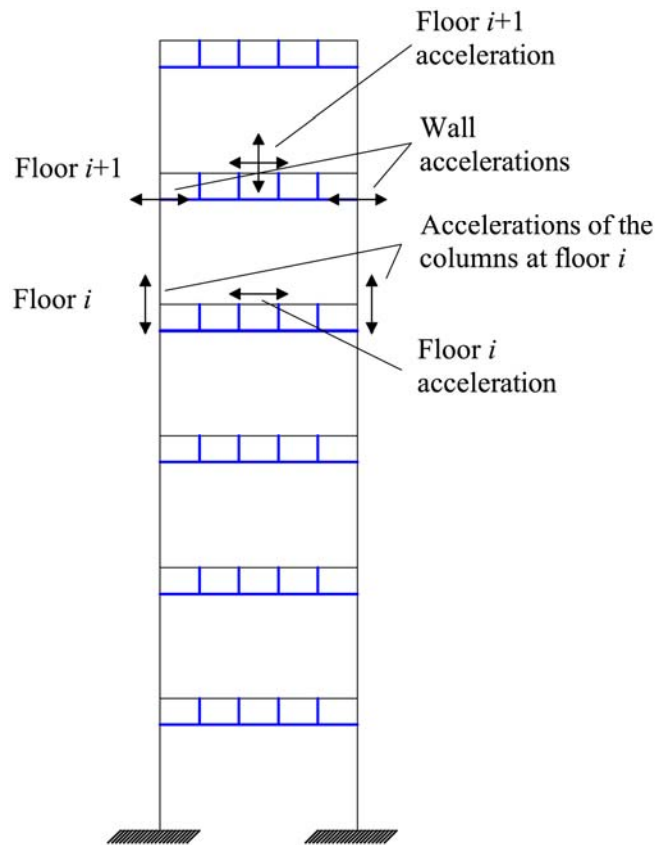


Demand parameter

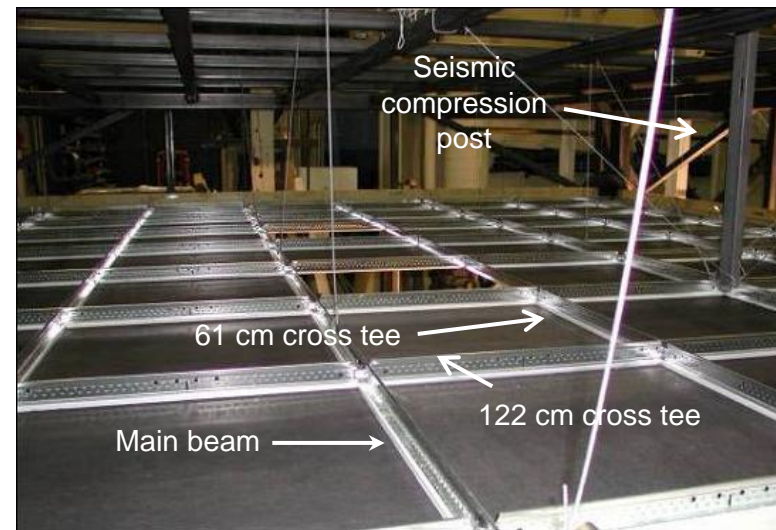
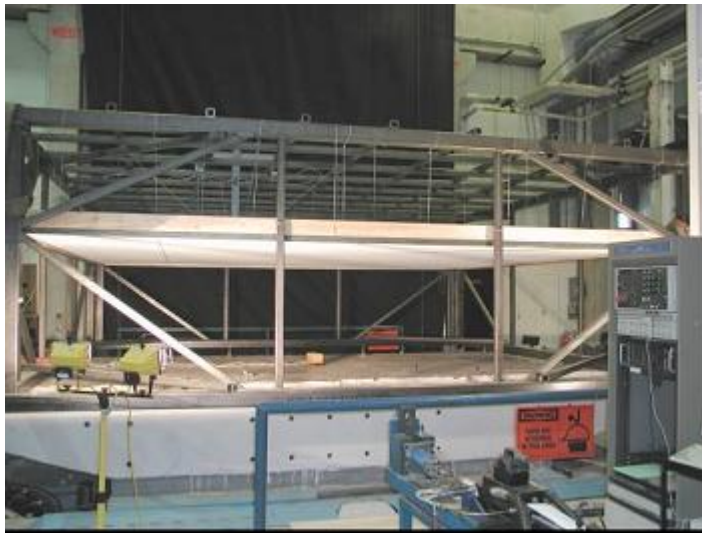
Damage states



Fixture for fragility testing



Fixture for fragility testing



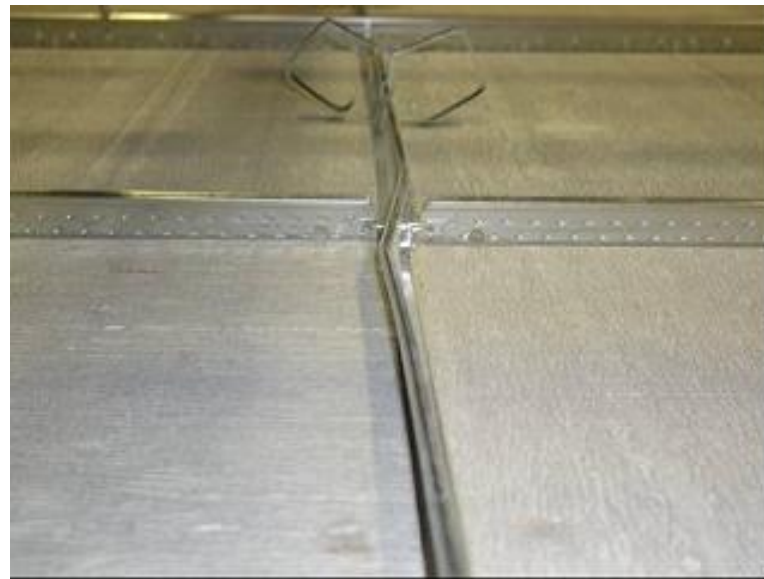
Damage states



DS1



DS3



DS2

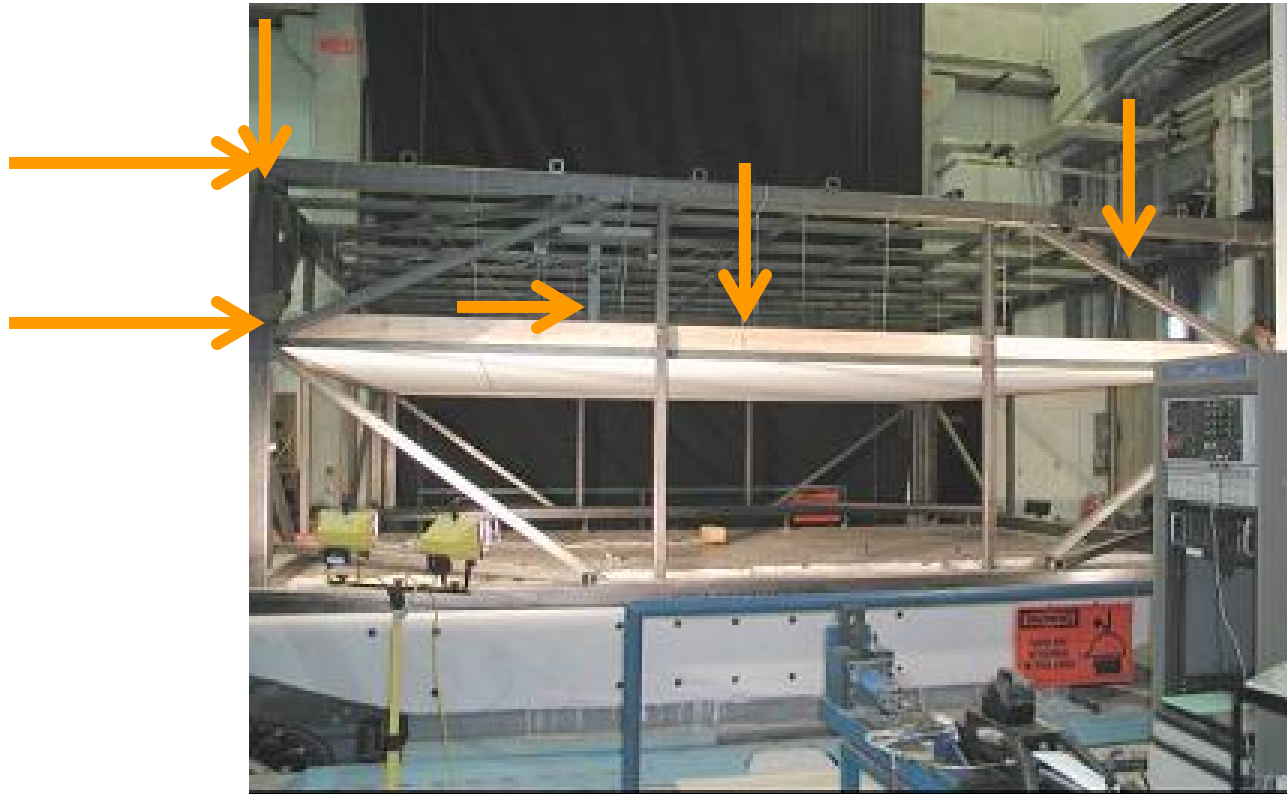


Demand parameters

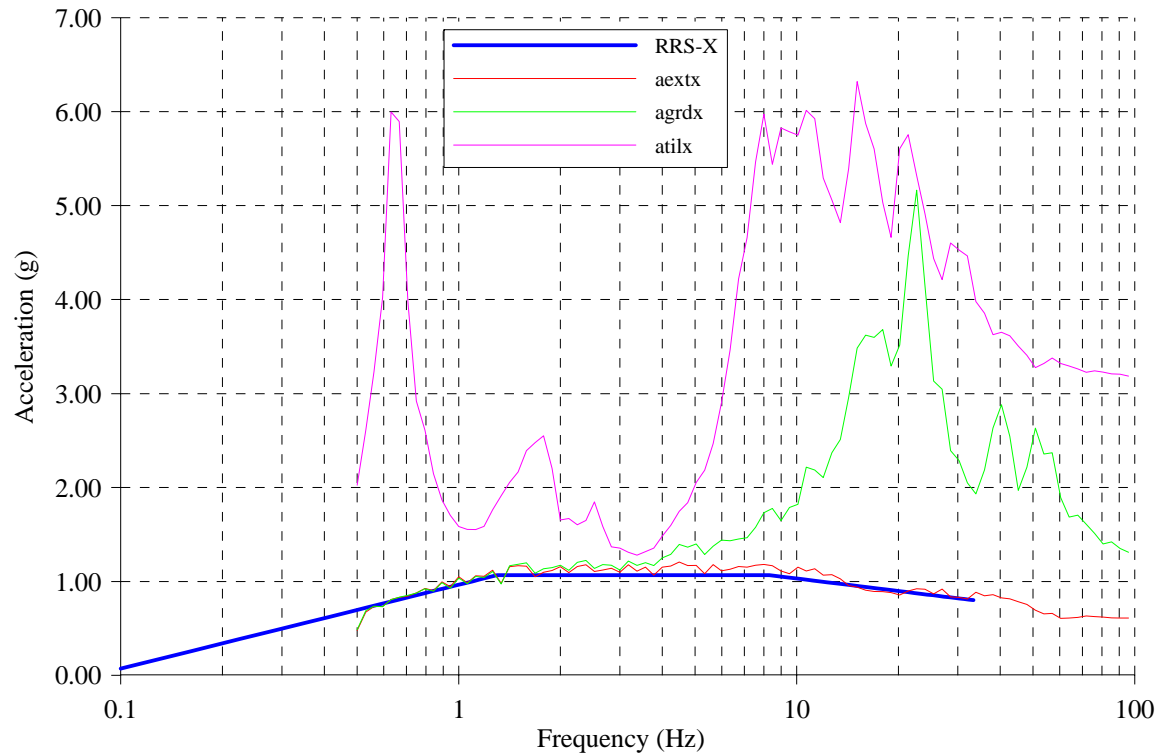
- Structural components
 - Deformations produce damage
 - In-plane axial load and shear force
 - Out-of-plane actions generally ignored
- Nonstructural components
 - Ceiling systems
 - Horizontal, X and Y, shaking
 - Vertical shaking, Z, shaking
 - Acceleration sensitive: X, Y, Z?
 - X, Y, Z; X and Y; X, Y and Z
 - Deformations?



Characterization of seismic input



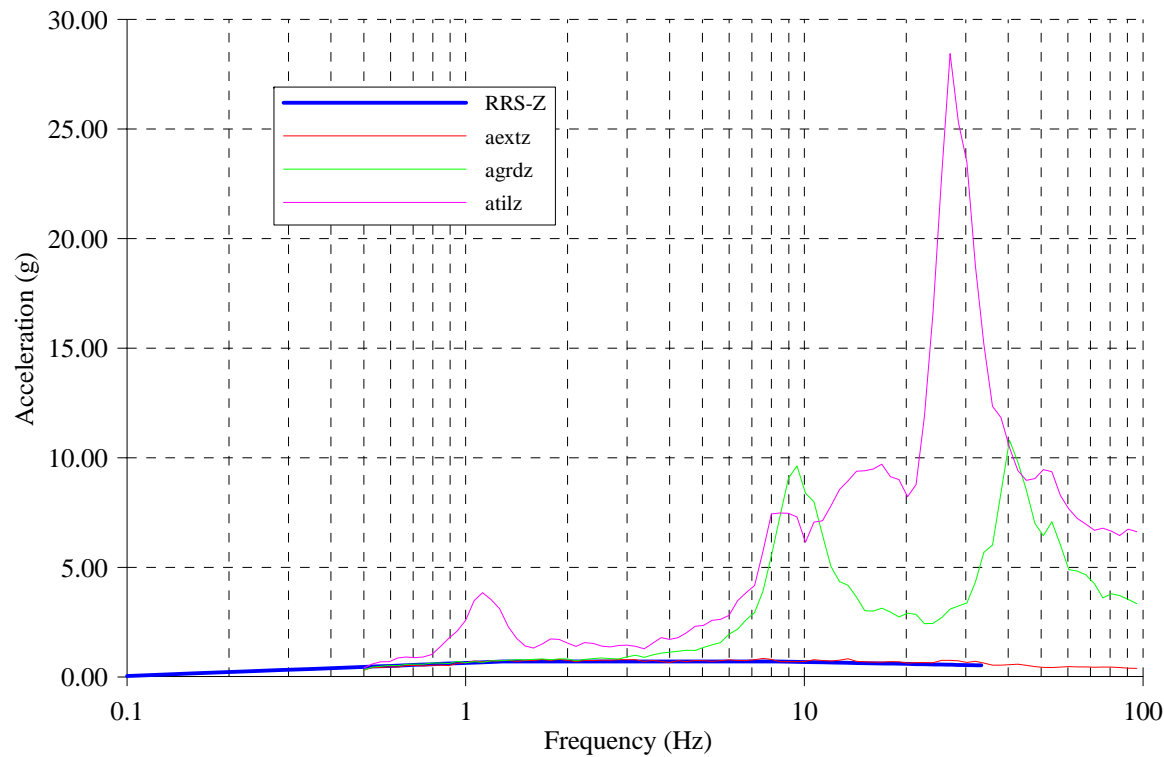
Characterization of seismic input



Horizontal shaking



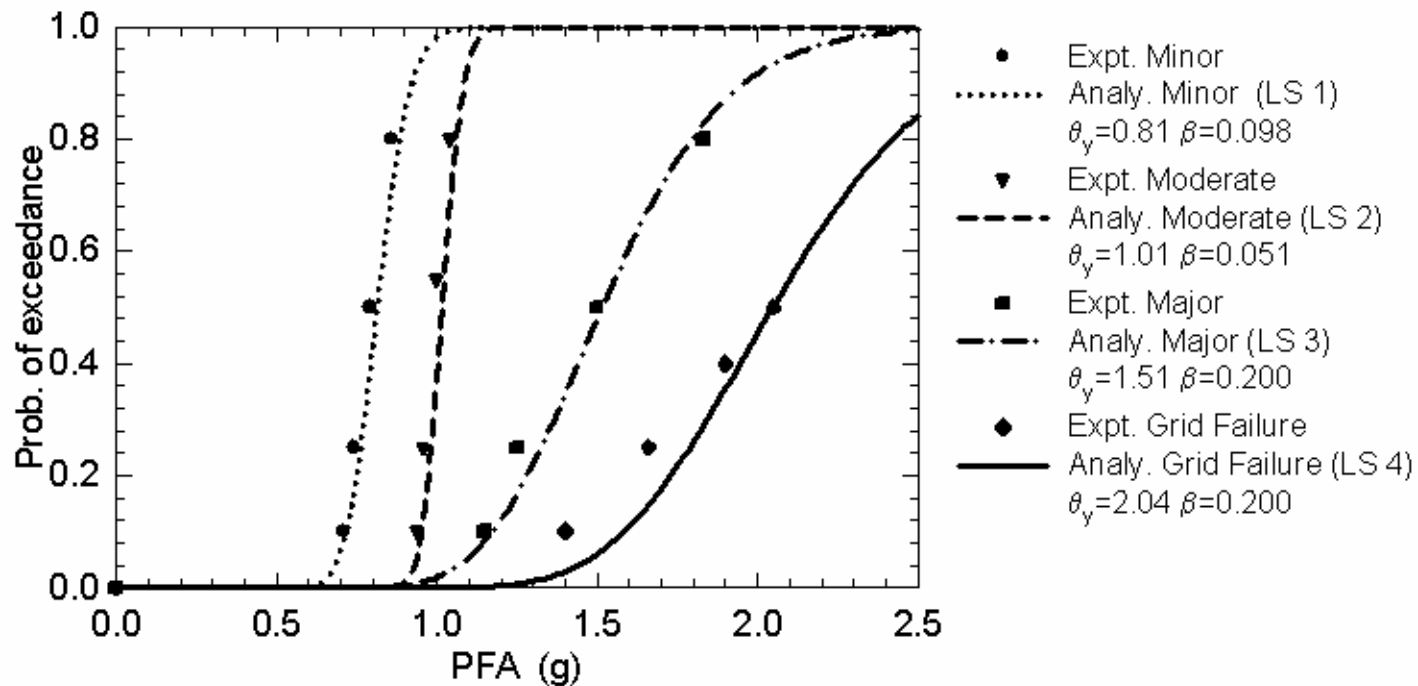
Characterization of seismic input



Vertical shaking



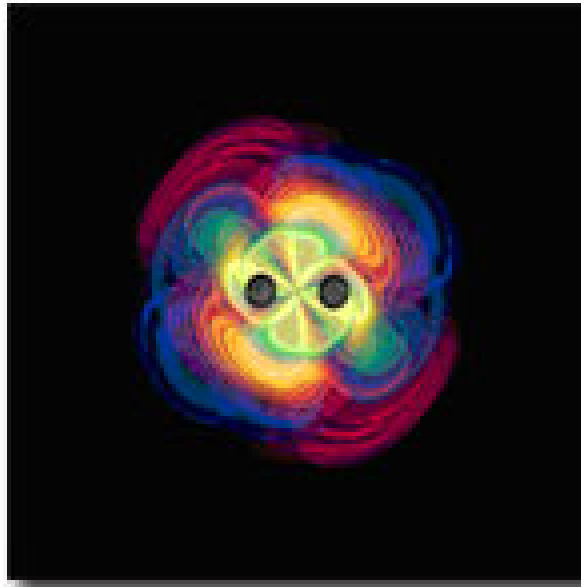
Sample fragilities for a ceiling system



?Questions?

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