

Title: Mitigating Effects of Wind and Seismic Hazards on Tall Buildings

Duration: April 2023 to March 2026

Deliverables:

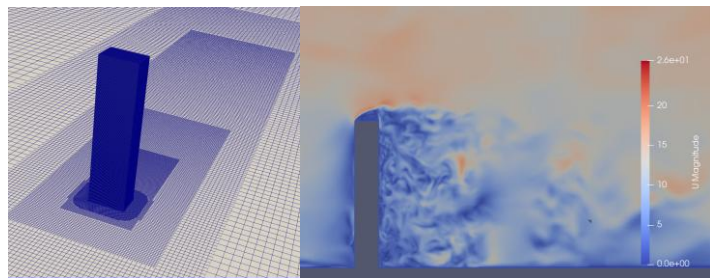
- Improved framework for assessment of wind induced cross-wind and torsional effects in rectangular tall buildings
- Damage limit states for typical tall building structural schemes, fragility and risk evaluation
- Development of passive isolation strategy for tall buildings

Significant Achievements:

- Design framework for evaluation of wind induced cross wind and torsional spectra for tall rectangular buildings as function of aspect ratio, side ratio, terrain category/turbulence intensity at building height.
- Large-Eddy Simulation of wind flow around rectangular tall buildings and validation with experiments under boundary layer inflow conditions.
- Estimation of reliability indices for RC tall buildings with reference to maximum drift
- Numerical investigations/parametric studies on the effect of damping in tall buildings and the efficacy of induced damping in a structural system
- Development of the floor mass isolation technique for seismic response control and experimental demonstration of the concept using the shake table experiments



Wind tunnel testing of 1:1.5:6 rectangular building model



CFD simulation on a tall building model using LES



Shake table testing of building frame with floor mass isolation

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