Title: Vulnerability Assessment of Reinforced Concrete Columns Prone to Brittle Shear Failure

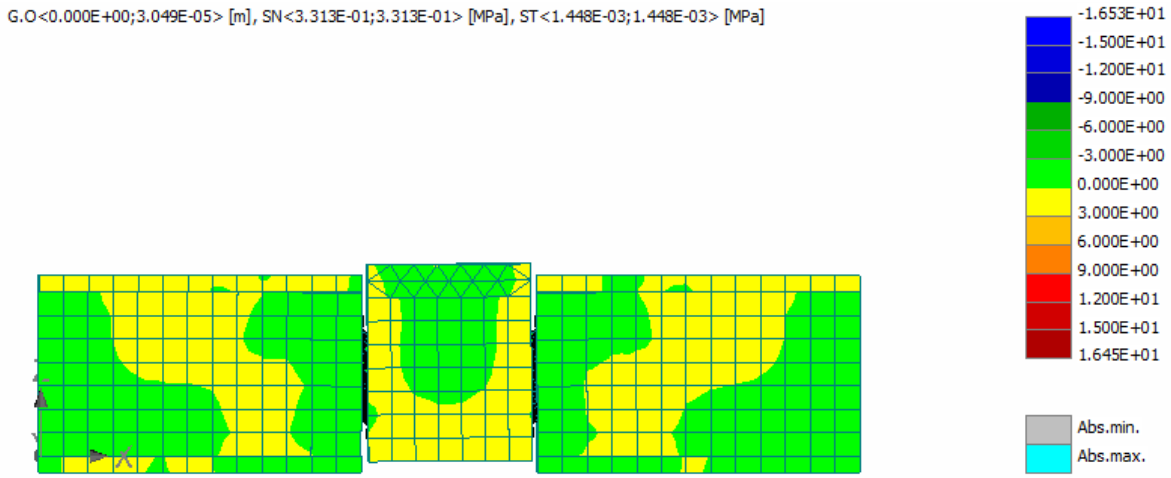
Duration: April 2024 to September 2025

Objectives:

- Experimental testing of plain concrete subjected to combined shear and normal stresses
- Development of relations for normal stress and shear stress separately for NSC and HSC

Progress Highlights:

- ❖ Numerical analysis and validation study conducted on concrete prisms by applying increasing pre-compression along specimen length and gradual shear loading on top surface with suitable boundary conditions as shown in figure.
- ❖ Trial experimental testing of notched concrete prisms were conducted for different notch depths and boundary conditions under shear loading
- ❖ Introduction of smooth frictionless contact between concrete and steel interface led to significant changes in crack pattern and shear strength of plain concrete
- ❖ Shallow notch depths were observed to change the crack propagation at notch locations and influenced the ultimate shear strength of specimens



Shear stress patterns in notched concrete specimen under load in ATENA software

Future Programme:

- ➢ Experimental testing of concrete under combined compression and shear loading to obtain the shear strength of concrete under increasing normal stresses

Project Leader:
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Team:
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Date: December 2024