Stress-dependent undrained shear behavior of remolded deep clay in East China

Cite this as: Xiang-yu SHANG, Guo-qing ZHOU, Yong LU, 2015. Stress-dependent undrained shear behavior of remolded deep clay in East China. *Journal of Zhejiang University-SCIENCE A (Applied Physics & Engineering)*, 16(3):171-181. [doi:10.1631/jzus.A1400255]

Object

- The mechanical properties of deep soil, especially the deep clay, have not yet been fully understood.

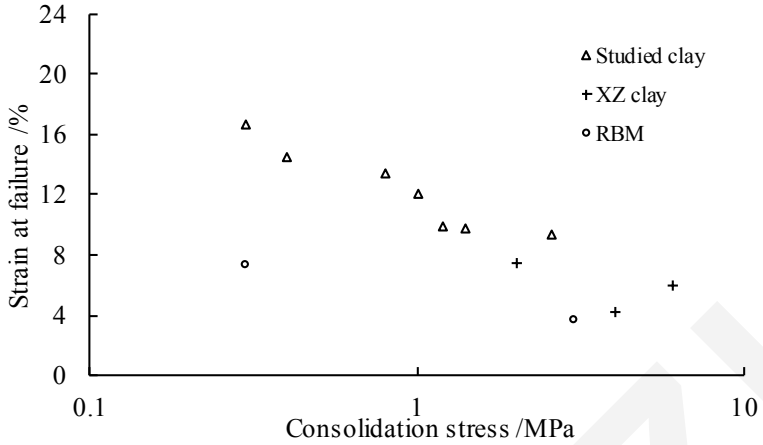
- As a preliminary step, this study aims to investigate the influence of confining pressures on the stress-strain-strength properties of undrained triaxial compression tests on remolded deep clay.

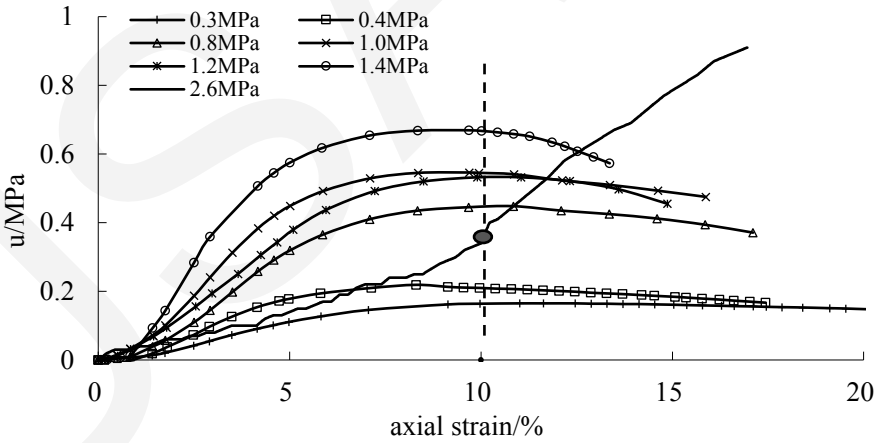
methodology

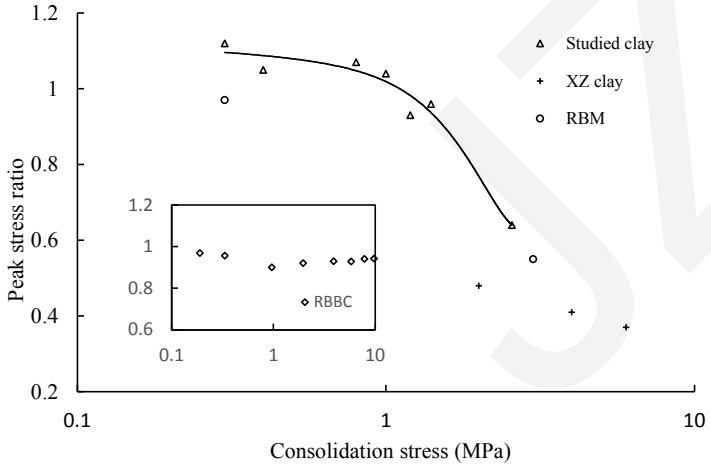
- Consolidated-isotropically undrained triaxial compression tests were performed on the reconstituted deep clay at a depth of about 600m in East China. The stress level ranges from 0.3MPa to 2.6MPa.
- The microscopic analysis based on ESEM observations was carried out to obtain the physical mechanisms underlying the observed stress-dependent mechanical behavior.
- The observed behaviors were discussed in the context of critical state soil mechanics.

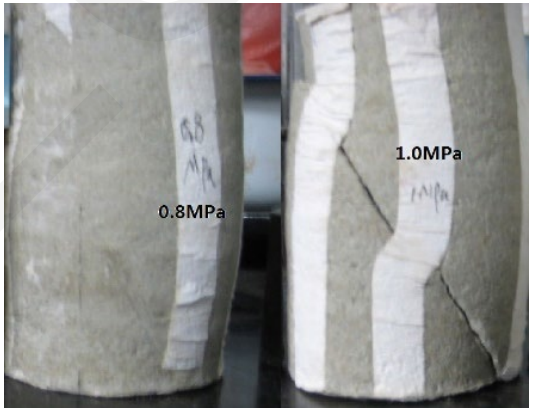
Results

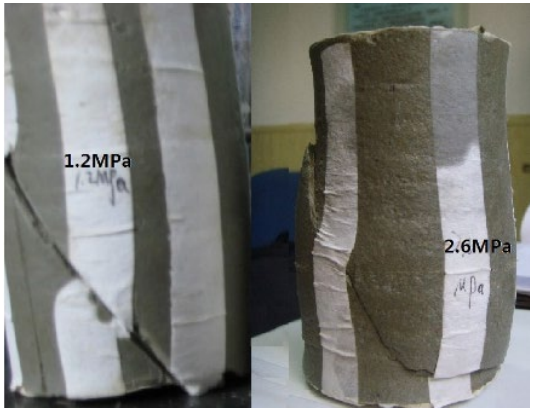
- Consolidation pressure has a significant effect on the stress-strain-strength properties of the clay.





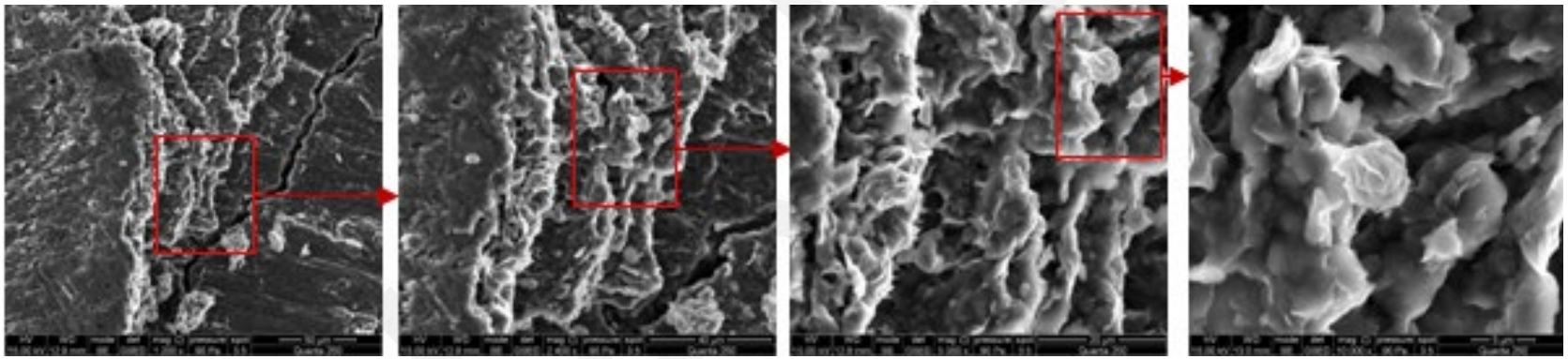






Results

- The micro mechanisms underlying the lower peak stress ratio and unusual pore pressure response in the case of higher consolidation pressure is closely correlated to the changes in the microstructure of clay specimens during shear.



Results

- The critical state of the studied clay at high consolidation pressure above 2 MPa is difficult to reach in the undrained shear test.