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An efficient parameter identification procedure for soft sensitive clays

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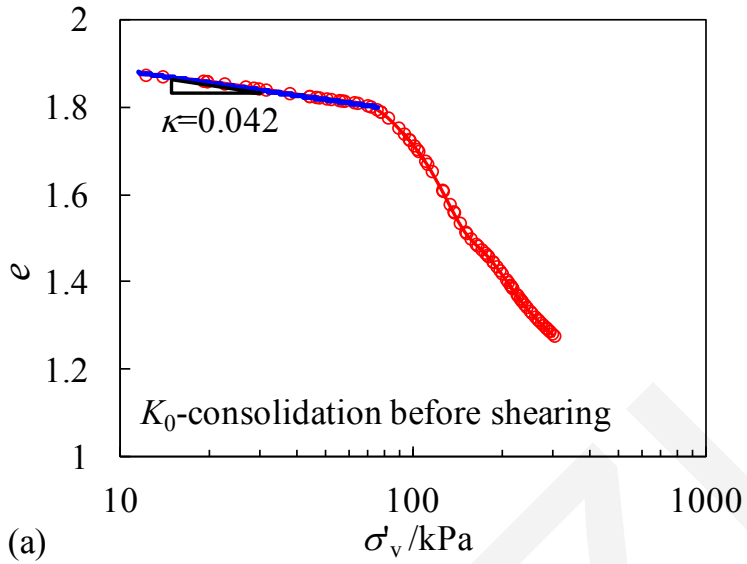
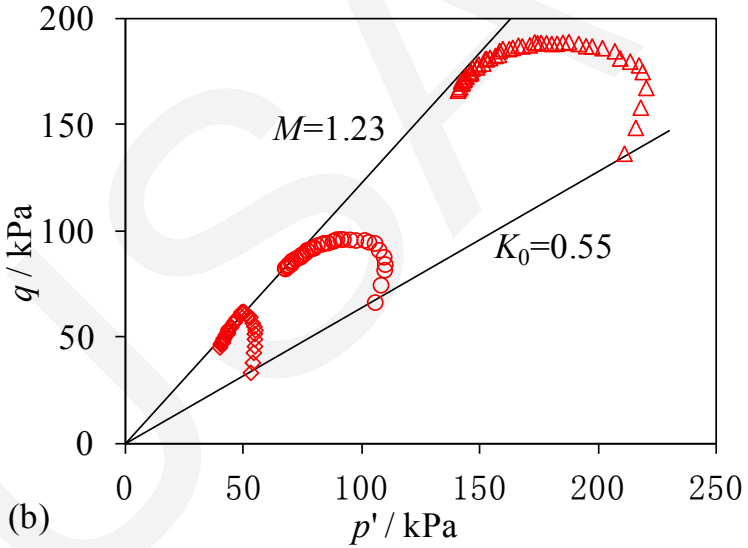
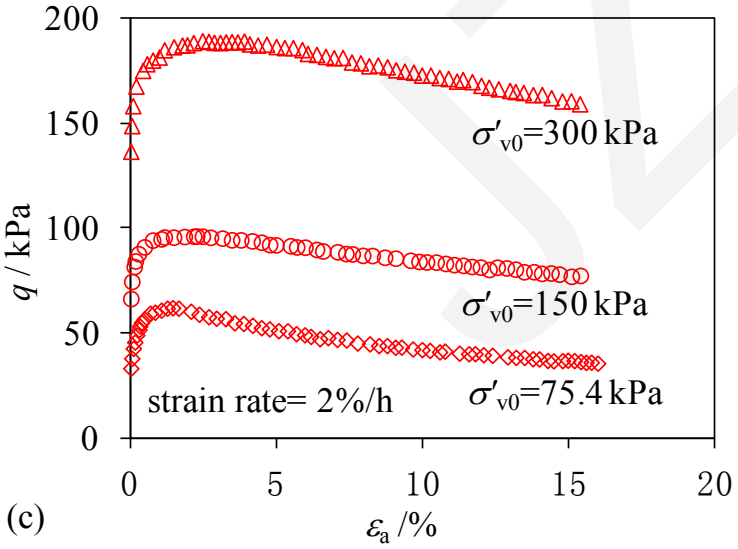
Difficulties of measing parameters

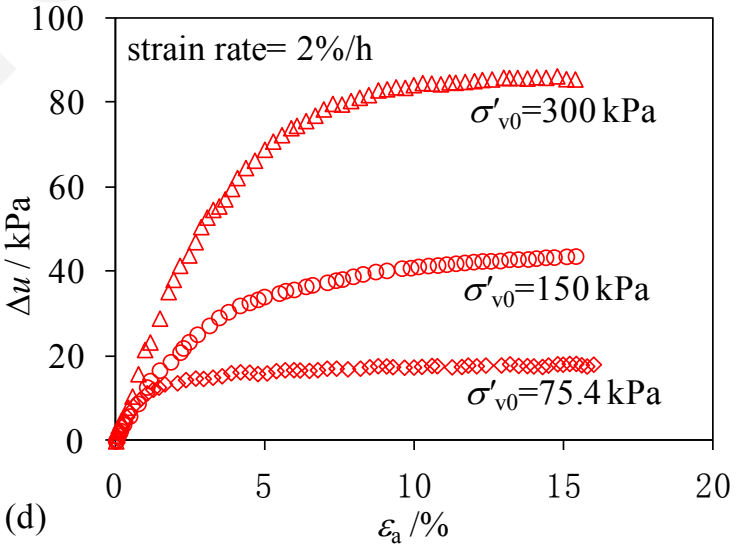
Typical laboratory tests of clay





e_0, κ
λ, M
…





C_{ae}?
S_t?
…

Related parameters

Parameters

$$\dot{\varepsilon}_v^{vp} = \frac{C_{\alpha e}}{(1+e_0)\tau}\left(\frac{\sigma'_v}{\sigma'_p}\right)^{\frac{\lambda-\kappa}{C_{\alpha e}}}$$

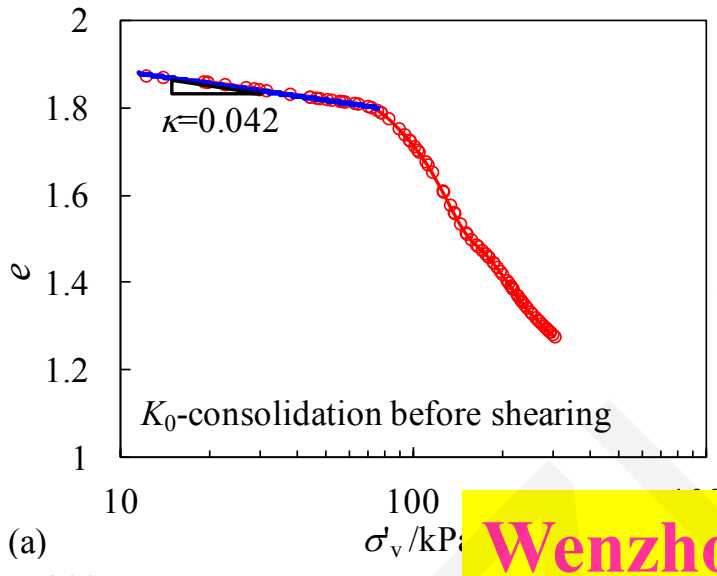
- **Parameters**
  - **Creep related**
    - C_{ae}
  - **Destructuration related**
    - χ_0
    - ξ, ξ_d

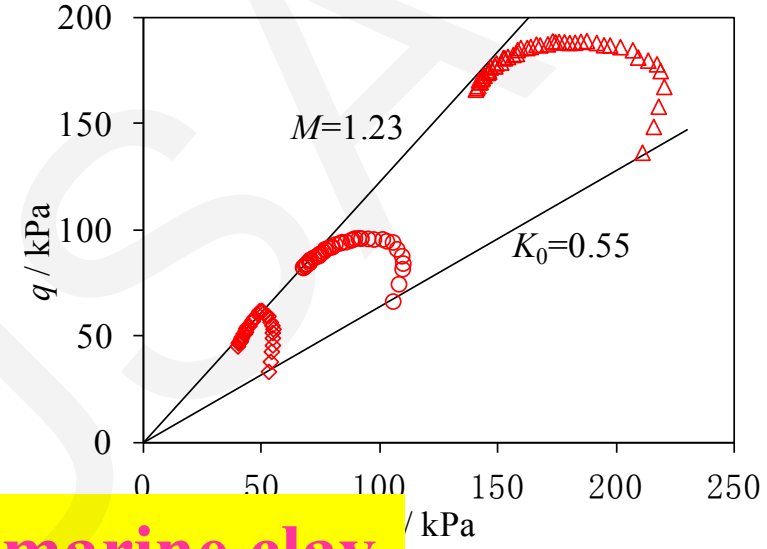
Bonding: $\sigma'^{r}_{p} = (1+\chi)\sigma'^{r}_{pi}$

Debonding: $\chi = \chi_0 \exp\left[-\left(\xi\varepsilon_v^{vp} + \xi_d\varepsilon_d^{vp}\right)\right]$

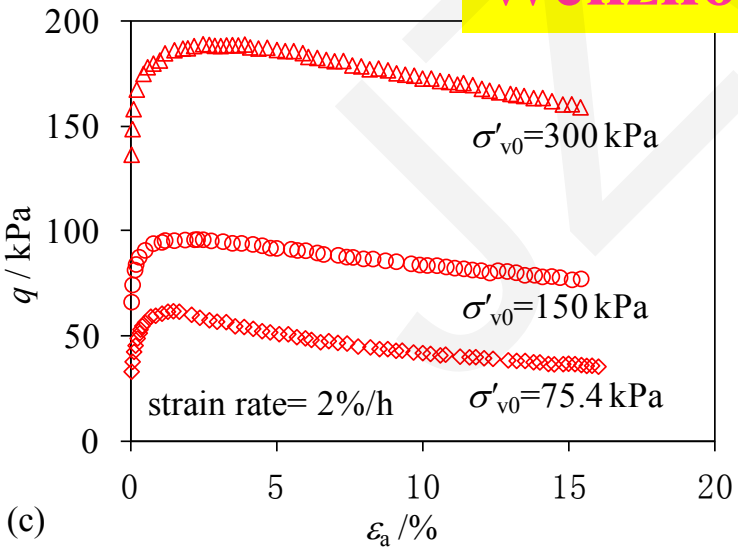
Related Parameters

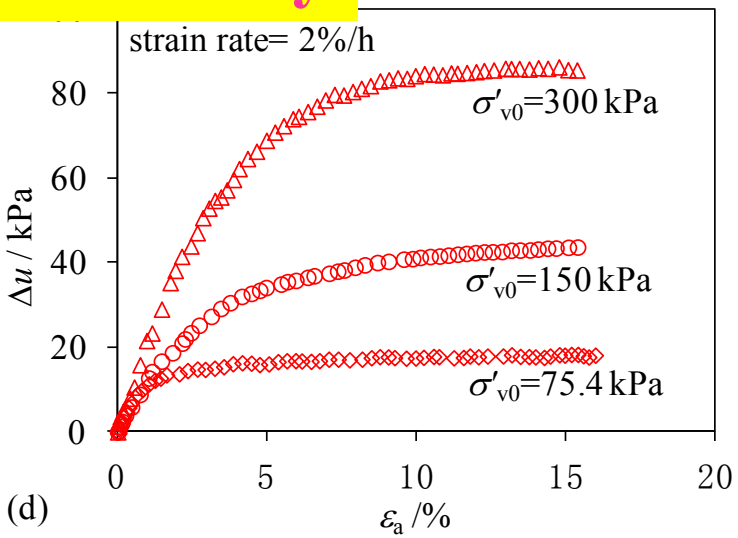
Objective tests





Wenzhou marine clay





Related Parameters

Adopted constitutive model

Modeling

Zhen-Yu Yin[1]; I

Abstract: The paper fo
various oedometer tests
experimental observatior
model accounts for inhe
parameters is discussed,
for the proposed model
coupled consolidation ar
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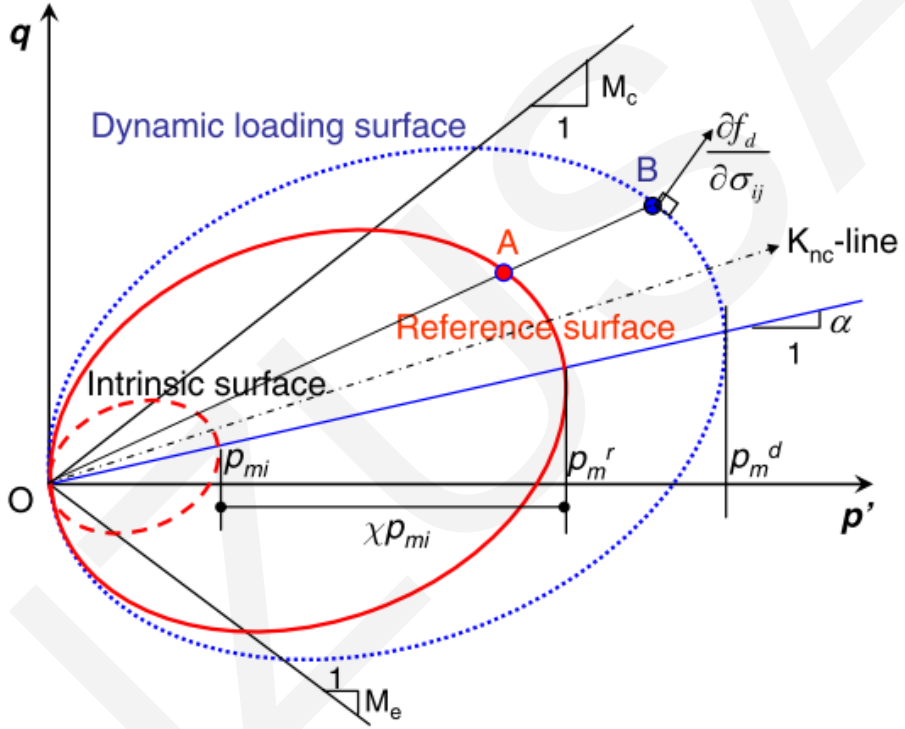


sitive Clay

d Matti Lojander[5]

evolution. For this purpose,
were carried out. Based on
s developed. The proposed
he determination of model
no additional test is needed
ement code, which enables
nensional and triaxial con-
ow that the model has good
0000527. © *2011 American*

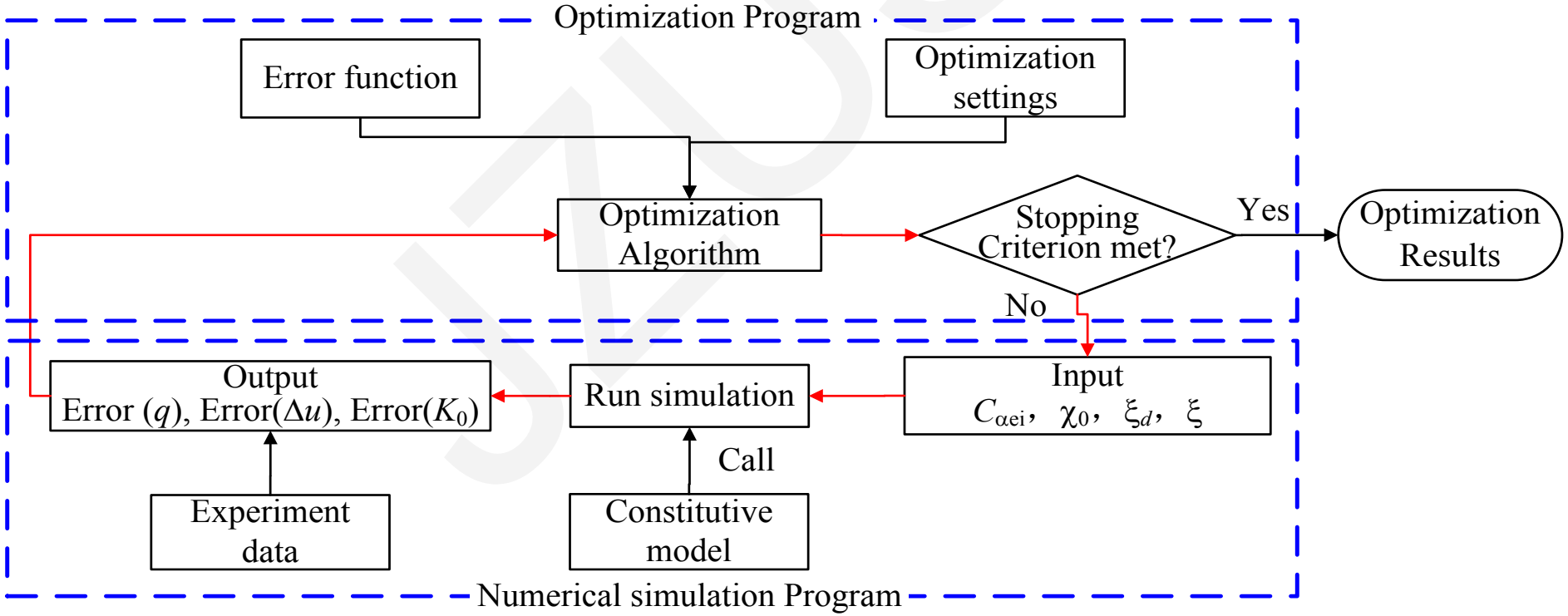
ANICREEP Model developed by Yin et al. 2011

Optimization Procedure

Procedure

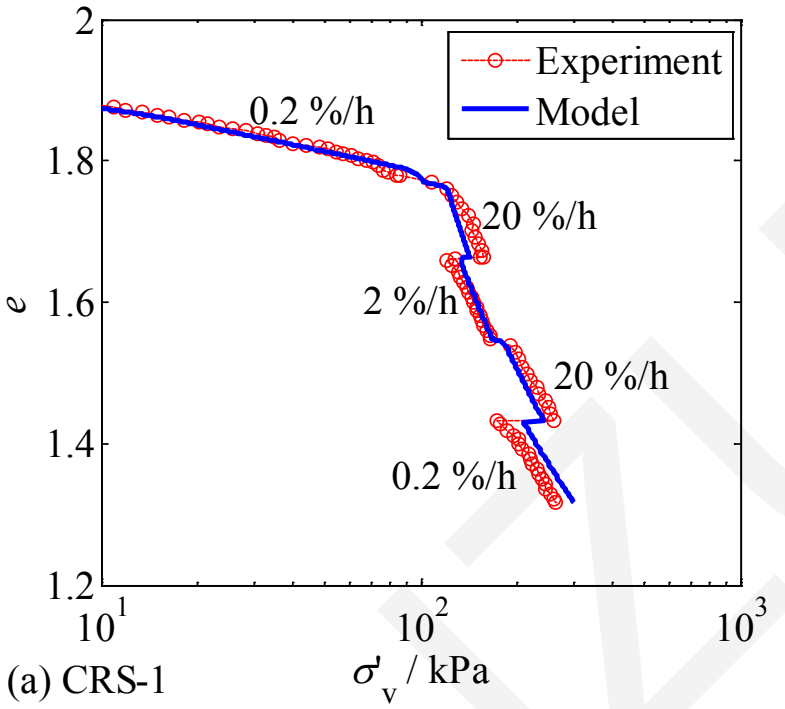
Mono-objective

$$\min\left[\text{Error}(x)\right] = \min\left[\frac{\text{Error}(K_0) + \text{Error}(q) + \text{Error}(\Delta u)}{3}\right]$$

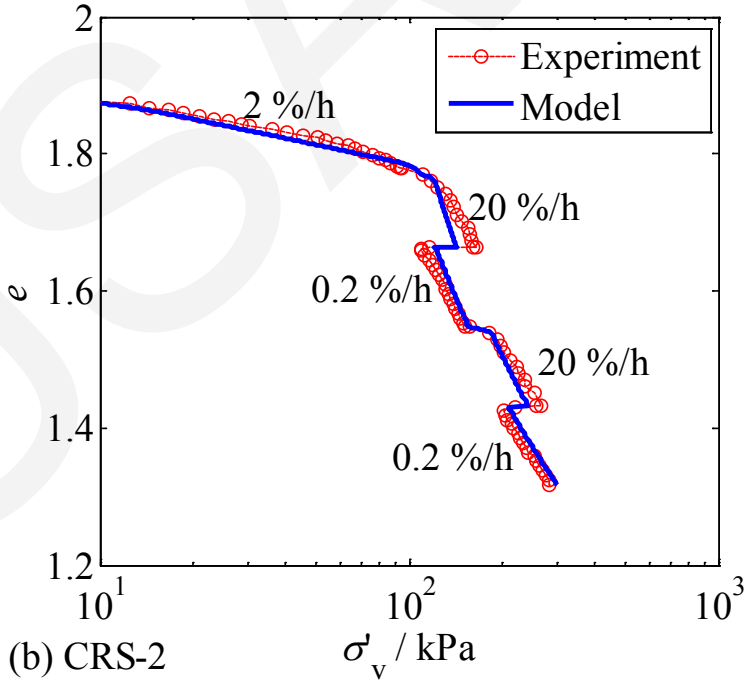


Validation

Validation based on simulations of other tests



(a) CRS-1



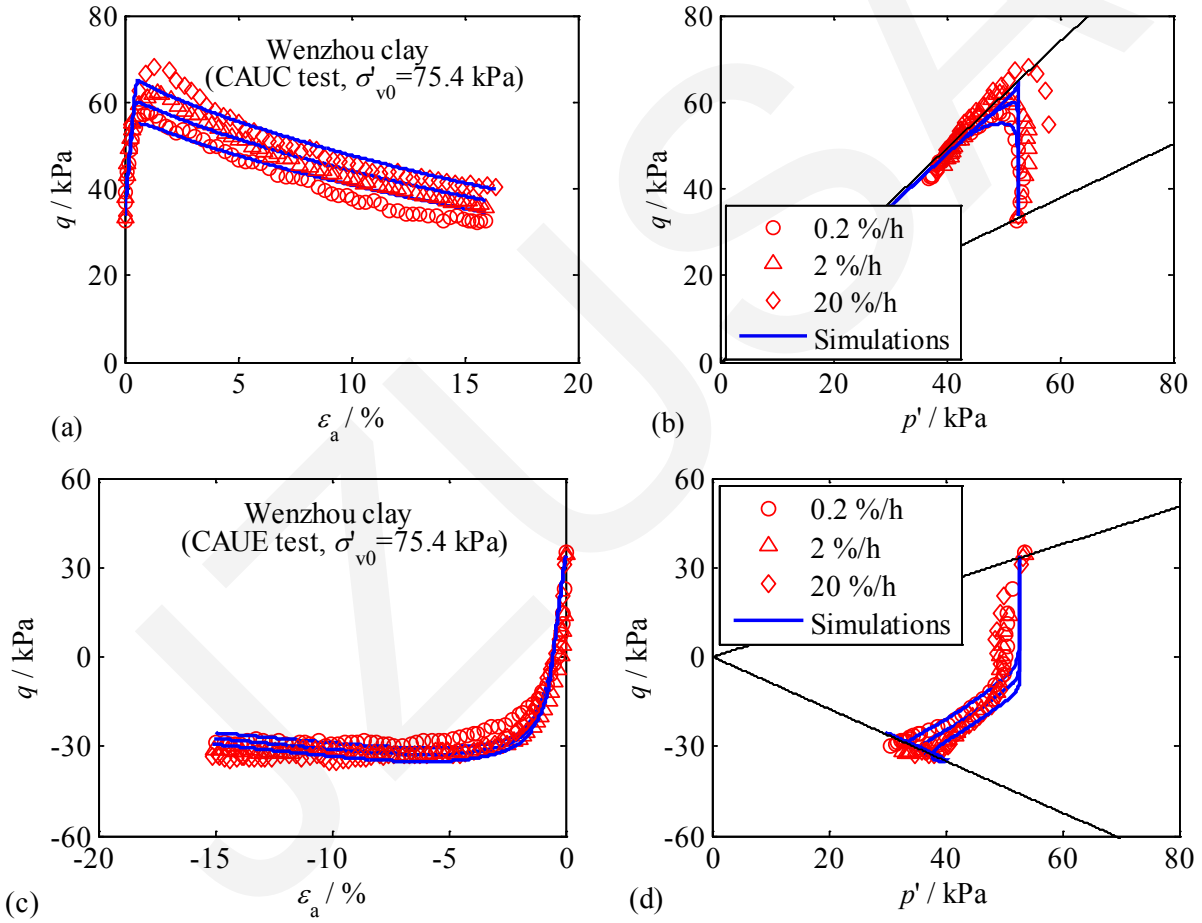
(b) CRS-2

1D CRS tests

ZJUSA

Validation

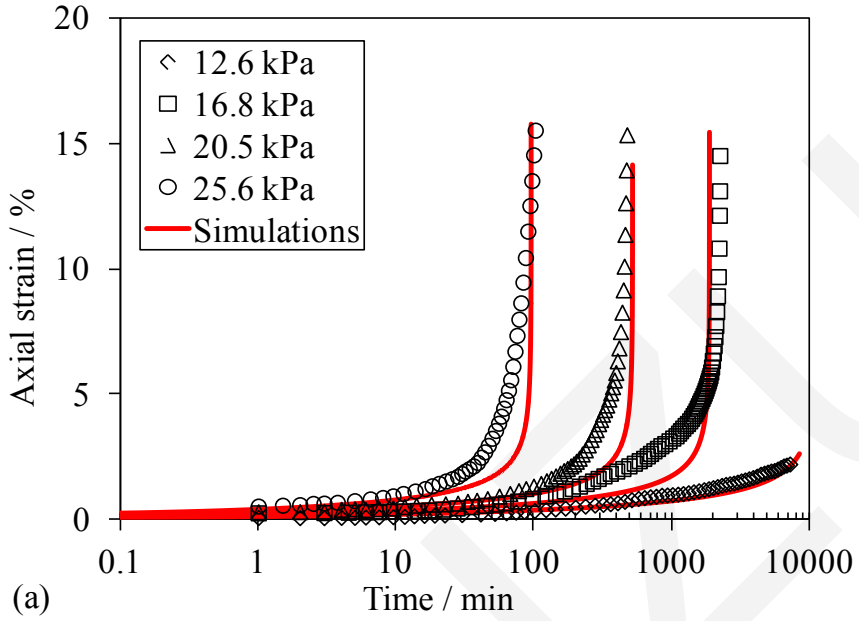
Validation based on simulations of other tests

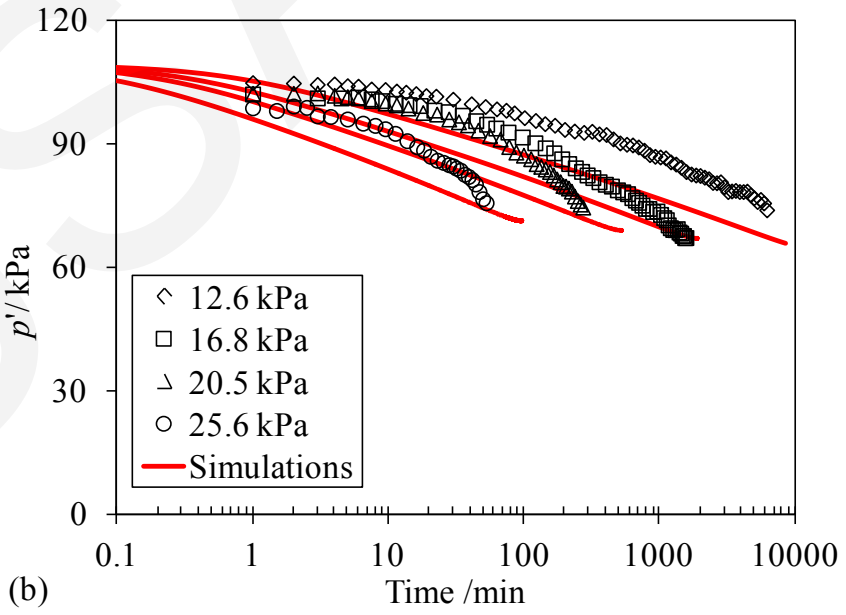


3D CRS tests: Compression and extension (σ'_{v0}=75.4 kPa)

Validation

Validation based on simulations of other tests





3D Creep tests

Conclusions

- An efficient optimization procedure for identifying creep and destructuration related soil parameters using standard experimental tests has been proposed.

- Future work may include the application of the advanced optimization methods, combined with advanced constitutive models, to field tests or measurements.

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