

## Micromechanical analysis of the behavior of stiff clay

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Abstract

Reference

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**Abstract** Cementations formed in geological timescale are observed in various stiff clays. A micromechanical stress strain model is developed for modeling the effect of cementation on the deformation behavior of stiff clay. The proposed approach considers explicitly cementations at intercluster contacts, which is different from conventional model. The concept of inter-cluster bonding is introduced to account for an additional cohesion in shear sliding and a higher yield stress in normal compression. A damage law for inter-cluster bonding is proposed at cluster contacts for the debonding process during mechanical loading. The model is used to simulate numerous stress-path tests on Vallericca stiff clay. The applicability of the present model is evaluated through comparisons between the predicted and the measured results. In order to explain the stress-induced anisotropy arising from externally applied load, the evolution of local stresses and local strains at inter-cluster planes are discussed.

**Keywords:** Stiff clay Destructuration Micromechanics Plasticity Induced anisotropy

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