

## 粉煤灰的力学特性及其弹塑性模拟

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## Mechanical Behavior of Fly Ash and Its Elastoplastic Modeling

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**摘要** 粉煤灰是一种不同于粘土的散粒状材料, 其应力比应变关系与平均应力和初始孔隙比有关. 对不同初始孔隙比的粉煤灰试样在不同围压下实施三轴固结排水剪切试验, 测得其应力应变关系, 并对考虑平均应力和初始孔隙比影响的临界状态模型进行部分修正, 模拟不同初始孔隙比粉煤灰试样的三轴固结排水剪切试验结果. 结果表明, 修正模型对粉煤灰临界状态线进行了简单的修正, 并且模型中状态参数和硬化/软化参数的应用较好地描述了粉煤灰的剪胀/剪缩和应变硬化/软化等特性.

**关键词:** 粉煤灰 等向固结 三轴试验 临界状态线 剪胀 应变软化

**Abstract:** Being different from clay, fly ash is a kind of granular material. The stress ratio-strain relation of fly ash is related to both mean stress and void ratio. A number of consolidated-drained triaxial tests were carried out on a fly ash with different initial void ratios under different confining pressures. Relevant stress-strain relations have been obtained. Simple modifications have been made to the elastoplastic model proposed by Yao, et al., which considers the mean stress and initial void ratio. The mechanical behavior of fly ash specimens with different initial void ratios from drained triaxial tests are consistently predicted by the modified model. The application of the state parameter and hardening/softening parameters in the critical state model can predict dilatancy, hardening and softening characteristics of the fly ash.

**Keywords:** fly ash, isotropic compression, triaxial test, critical state line, dilatancy, strain softening

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