

## 基于电性变化进行黄河水下三角洲饱和粉土触变过程研究

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**摘要** 为了研究黄河水下三角洲饱和粉土触变过程特性及探索进行粉土特性研究的新型原位试验手段, 在黄河口潮坪区不同位置沿深度方向取50 cm长土样; 现场测试了垂向振动作用和外力停止后恢复过程不同深度区间, 土样电阻率随时间的变化。基于对该地区饱和粉土电性影响因素分析, 研究了垂向作用力下粉土体触变过程中土体变化的时空规律。垂向振动作用过程中, 粉土体沿深度方向发生分层变化, 上部土体变软直至流体状态从而导致电阻率降低, 下部土体密实度增加从而导致电阻率增大, 达到一定的振动次数后电阻率保持稳定。这些现象表明: 土体状态并不随振动的持续进行而发生连续变化。外力停止后, 测试电阻率随时间的变化特征显示土体在保持新状态一段时间(2 h)后才逐步向初始状态恢复, 恢复过程也不尽相同, 大约6 h后可恢复到初始状态。对试验样品的横切观测表明了所研究结果的正确性。

**关键词** [土力学](#); [饱和粉土](#); [触变](#); [电阻率](#); [土体状态](#)

分类号

## RESEARCH ON THE THIXOTROPY CHARACTER OF SATURATED SILT SOIL IN YELLOW RIVER DELTA WITH ELECTRICAL RESISTIVITY METHOD

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### Abstract

On purpose of studying the thixotropy character of saturated silt in Yellow River Delta and searching a new in-situ measuring method to test the state change of silt, the electrical resistivities of different sections in some 50 cm-long silt soil samples were tested, which were sampled vertically from silt soil layer at different spots of the Yellow River estuarine area, when they were being librated vertically and after the libration stopped. On analysis of key factors influencing the resistivity variation of saturated silt, it was revealed that the state of silt soil would vary along depth with time during being librated vertically and after the libration stopped. During being librated vertically, the top section of silt soil layer will become melting until hydro-state which makes resistivity of this section decrease, while porosity of the bottom section of silt soil layer decreasing and the resistivity of this section increasing. But the resistivities of different sections would not vary with time while being continually librated vertically, which shows the state of silt soil will not vary continuously as being librated vertically. After the libration stopped, the varied silt soil will transform to the original state. Relation between resistivity and time shows the varied silt soil will keep the new state for about 2 hours firstly, then transform to the original state slowly in 6 hours. The cutting picture of librated silt soil sample proves the analysis of state transform of slit soil is validity with resistivity method.

**Key words**

### 扩展功能

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