# Study of Interparticle Ultimate Shear Stress in Soils

章致一,吳淵洵,李明書
Civil Engineering
Architecture
jasonwu@chu.edu.tw

## Abstract

The plus sign in the Mohr-Coulomb's equation conceals an inherent hypothesis. According to the principle of superposition of forces in physics, it expresses that the shear stresses contributed by the cohesions and the frictions are occurring on a shear plane simultaneously. However, such assumption has never been questioned since the application of this equation in 1776. This paper proposes that before the combination of any two types of shear stress, they shall be examined if they are identical physical events with the same spacetime coordinates. This research conducts a series of stress-controlled and strain-controlled direct shear tests to verify this assumption. Test results have shown that both cohesion and frictional resistance occurred neither simultaneously nor in the same space. In conclusion, for a given failure plane of a soil, it is likely to occur only one type of shear stress under a physical spacetime.

Keyword：shear stregnth, interparticle stress, Mohr-Coulomb's theory