

Internal structure evolution and particle-scale deformation mechanism of 2D simulated and experimental granular assemblies

Xia Li*, Quan Yuan[†], Zhaofeng Li[†] and Yu-Hsing Wang[#]

* Professor, School of Civil Engineering, Southeast University, Sipailou #2, Nanjing, Jiangsu Province, 210096, P.R. China, e-mail: xia.li@seu.edu.cn

[†] Research student, Department of Civil and Environmental Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong SAR, China

[#] Professor, Department of Civil and Environmental Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong SAR, China

ABSTRACT

Due to the effect of internal structure, granular assemblies exhibit different deformation response to the imposed stress path. This talk provides a detailed investigation into the material internal structure and local deformation of two dimensional granular assemblies. Multi-scale data have been collected by conducting two-dimensional discrete element simulations[1] of different frictional coefficients and different shape, and experimental investigation on 3D printed cylindrical rods[2]. The material internal structure is described in terms of the void cell system [3], and the statistical features have been extracted and presented. Local strain has been calculated by invoking the micro-structure strain definition [4]. Efforts have been placed upon the correlation between local deformation and local structure and force-transmission. Discussions are extended to the influence of surface friction and particle shape on structure stability and re-configuration.

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