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**Comparison between bridges and force-chains in granular packings**[1] LING ZHANG, SHUXIAO CAI, ZUNPENG HU, Department of Physics, Shanghai Jiao Tong University, Shanghai 200240, China, JIE ZHANG, Institute of Natural Sciences and Department of Physics, Shanghai Jiao Tong University, Shanghai 200240, China — In dense granular materials, there exist chain-like force networks from which we can obtain much information on the mechanical properties of packings. But it is extremely difficult to characterize these structures, especially in 3D packings. Mehta and her coauthors have proposed theoretically that bridge-like structures can form because of spatial inhomogeneity and large fluctuations, and they conjecture that these mesoscopic geometric structures play the role of force-chains (Mehta et. al. 2004, Pugnaloni et. al. 2001). Some statistical features of bridges have been observed in a recent paper by Mattew C. Jenkins et al (Jenkins et. al. 2011). Despite the success, the lack of independent force network information makes the justification of Mehta et al.'s theoretical conjecture inconclusive. In this study, we focus on the comparison of bridges and force-chains in two different granular packing using photo-elastic granular particles. We have found no clear evidence that there exists a one-to-one mapping between bridges and force-chains. Nonetheless, for systems of different force chain structures, it does seem to show some differences in the respective bridge structures. This seems to suggest that some connection may exist between bridges and force-chains.

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