Micromechanical Indictors for Post-liquefaction Behaviors of Granular Soil

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The post-liquefaction behaviour of granular soils during cyclic loading includes the jamming transition under constant volume constraint. Besides the density, the internal structure also plays an important role in determine the jamming transition. A new way to do the internal structure quantification is proposed based on the Radical Voronoi tessellation and cell shape description. The internal structure is quantified by two internal variables, degree of inhomogeneity and degree of anisotropy, which are independent to each other. To study the post-liquefaction behaviour, discrete element simulation is employed with 2D spherical particles under constant volume constraint. The relation between post-liquefaction behaviours and internal structure is investigated.
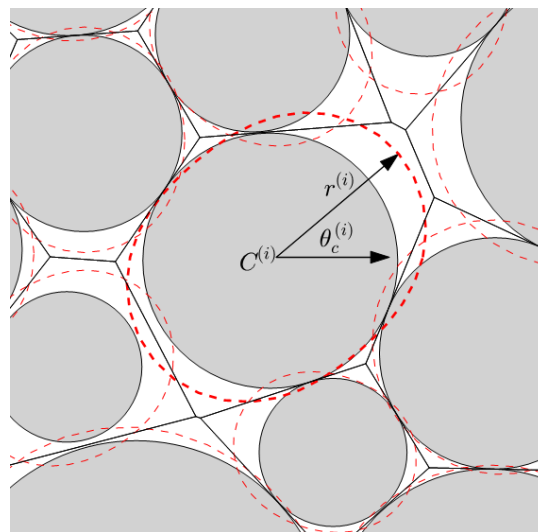
Figure 1. Radical Voronoi tessellation to the two dimensional granular packing (black solid line); Fourier expression to approximate the polygon-shaped cell (red dot line)

References

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