



## **A methodology to reconstruct sand packs from high resolution 3D images**

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In this paper, we propose a model to generate 3-D volumes of sand to mimic natural sand systems. The model generates structures by incorporating pre-specified physical properties of sand packs obtained from 3-D computed tomography volumes. Properties include particle size distribution, porosity, local void ratio, sphericity, angularity and distribution of particle contacts (i.e., coordination number). A constrained nonlinear optimization formulation is used to attain the required properties. Validation of the model was achieved using 3-D volumes of glass bead systems and tested for isotropy, heterogeneity and randomness. The model can be used to investigate the impact of variation in packing arrangement of particles and the macroscopic properties of the produced pore-structure.