# Abstract

We present a 3D numerical model applied to study the onset of the boiling phenomenon in a polydisperse granular material by computing the critical hydraulic gradient. The sample is constructed by means of the Discrete Element Method (DEM), then subjected to an upward increasing hydraulic gradient until the intergranular forces vanish. The hydrodynamic forces applied on solid grains are computed by means of the Lattice Boltzmann Method (LBM). To reduce calculation time, bi-periodic boundaries are implemented in both horizontal directions and for both fluid and solid (grains) materials. The results are in good agreement with the classical values of the critical hydraulic gradient