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Granular dynamics of the mixing processes for different RPM using DEM

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The granular materials are usually assemblies of complex bodies varying in size, shape and surface properties. It is often extremely complicated to handle since granular materials reveal very different behaviour under different circumstances, there is therefore need to understand how the granular layer behaves when mixing.

This paper emphasizes on the computer simulations of the granular materials via Discrete Element Method (DEM) by using open-source software LIGGGHTS. The examined process was mixing of two granular materials distinct by colour. The different initial conditions have led to finding the best way of homogenization, but it also shows the new perspective of noticing the process as a system of inseparable processes linked to each other.

Unlike the continuous simulations this method neglect the interstitial fluid, it helps to simulate motion of each particle and can be described by the second Newton law, where a sum of all forces affecting the particle consists of the pairwise contact force and the external forces. In this case the only gravitation is assumed as the external force.

In this contribution effect of different RPMs were examined. The different behaviour of granular system comes out with varying initial conditions. The behaviour of the concentrational and flow patterns dependent on the frequency of RPM was observed. It helps us to understand the process of homogenization valued by the Lacey and Poole mixing indices.

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