

# Simulation Model of Powder Movement in Packed Bed by Discrete Element Method

**KIKUCHI Shin**

Institute of Multidisciplinary Research for Advanced Materials,  
Tohoku University, Sendai,  
Japan

*Powder in the moving bed of burden has a large effect on the productivity and efficiency of the blast furnace process. Therefore, an investigation on the effect of the powder's physical properties and the moving bed material on transport phenomena and the accumulation mechanism of powder are essential.*

*In the present study, the motion of powder particles was simulated using the discrete element method (DEM), and the effect of the powder particles' shape on the movement and accumulation of in packed bed was investigated. The amount of clogging of powder at a bottleneck in the moving bed increased with increasing contact friction coefficient and rolling friction coefficient. Contact and rolling frictions are little effect on the lowering of powder velocity at particle contact. Increase of detention time in the packed bed is caused by that the moving distance of the particle is increased in length of path by clogging of powder.*

Co-authors: **Tatsuya Kon, Shigeru Ueda, Ryo Inoue, Shungo Natsui, Tatsuro Ariyama**