

Description of Additional Supplementary Files

File name: Supplementary Video 1.

Description: Computational simulation of solid-liquid transient analysis by using a discrete phase model to compare the movement of spheres under orbital mixing.

File name: Supplementary Video 2.

Description: Computational simulation of solid-liquid transient analysis by using a discrete phase model to compare the movement of spheres under vertical mixing.

File name: Supplementary Data 1.

Description: The source data of Figure 1d and Figure 2c.