

Erratum: Soft particle clogging in two-dimensional hoppers [Phys. Rev. E 104, 044909 (2021)]

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In this Erratum, we correct two math errors in this paper.

In Sec. IV A we incorrectly stated δ/d for the simulation data. The correct formula is $\delta/d = g/(2F_0)$ (in the limit of small δ). This corrected formula is a factor of 4 smaller than the erroneous formula and accordingly shifts the data plotted in Fig. 4. The new version of this figure is shown here, with the circles shifted to the left by a factor of 4. Given that this graph uses a logarithmic axis for δ/d that spans several decades, the shift of a factor of 4 does not appreciably change the conclusions of the plot: all of the symbols follow a common trend.

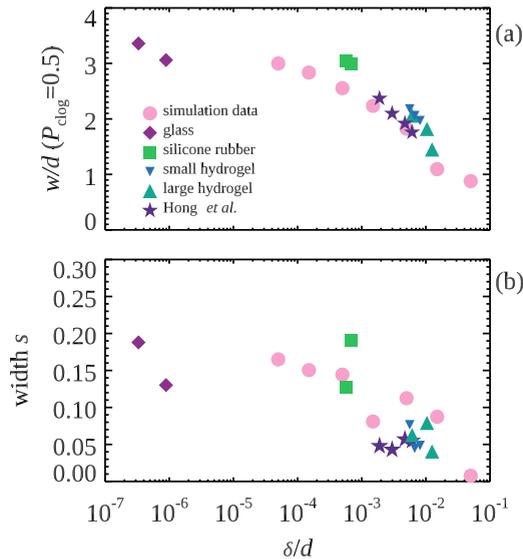


FIG. 4. Corrected Fig. 4 showing sigmoidal fit parameters. (a) Centers of sigmoidal fits for different types of particles under varying gravity, with the symbols corresponding to distinct experiments or simulations as indicated in the legend. (b) Width s of sigmoidal fits.

Additionally, Sec. III has an incorrect statement about the simulation's implementation of the wall force. The original paper states that the wall force is identical to the droplet-droplet force [Eq. (2)] using $R_j = R_{\text{wall}} = 0$. An additional change to Eq. (2) is needed: replacing the vector \vec{r}_{ij} with the unit vector $\hat{r}_{i,\text{wall}}$. The correct formula for the force from the wall is

$$\vec{F}_i^{\text{wall}} = F_0 \left[\frac{1}{|\vec{r}_i - \vec{r}_{\text{wall}}|} - \frac{1}{R_i} \right] \hat{r}_{i,\text{wall}}.$$

The key conceptual difference between the droplet-droplet force and the droplet-wall force is that the droplet-droplet force has a finite maximum as the droplet centers approach ($\vec{r}_{ij} \rightarrow 0$), while the wall force diverges as a droplet center approaches the wall. This has the fortunate effect of keeping droplets in the hopper, no matter how large the driving force of gravity is.

In summary, these issues do not affect the conclusions of the paper.

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