Erratum: Collision dynamics of granular particles with adhesion [Phys. Rev. E 76, 051302 (2007)]

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(Received 5 March 2013; published 29 March 2013)

DOI: 10.1103/PhysRevE.87.039904 PACS number(s): 45.70.Vn, 45.50.Tn, 46.05.+b, 99.10.Cd

A transcription error in the numerical implementation of $\xi''(a)$ in Eq. (34) affected the size and velocity dependence of the restitution coefficient ϵ but did, however, not affect the inferred critical velocity $g_{\rm cr}$. As a result, Figs. 2 and 3 of the published article were revised with the two foremost changes being: First, differences between results for the two different types of initial condition (type I: $a_{\rm init} = a_0$ and type II: $a_{\rm init} = a_{\rm eq}$) are minor. Second, in the limit of large spheres ($R_{\rm eff} \to \infty$), collisions are purely elastic ($\epsilon \to 1$). In addition, the proportionality constant q, provided directly following Eq. (46) for both type I and type II initial conditions, should read $q = 1.45$ ($a_{\rm init} = a_{\rm eq}$) and $q = 0.63$ ($a_{\rm init} = a_0$), respectively. Although numerical results in Fig. 4 were unaffected, analytical estimates now agree well with the numerics in the limit of large spheres ($R_{\rm eff} \to \infty$) for *both* type I and type II initial conditions. Consequently, Figs. 2–4 should be replaced with the revised versions provided herein.

In light of these changes the last two sentences in the caption of Fig. 3 have been amended and the corrected caption is given here.

Also, the passage towards the end of Sec. IV, reading

"Contrary, whenever adhesion is involved . . . , the more energy is lost during contact."

as well as the passage towards the end of Sec. V, reading

"Note that the initial conditions of type II . . . to an indirect account for dissipation."

should be disregarded.

None of the conclusions of the published article, however, are affected by these changes.

We would like to thank S. Krijt for bringing this to our attention.

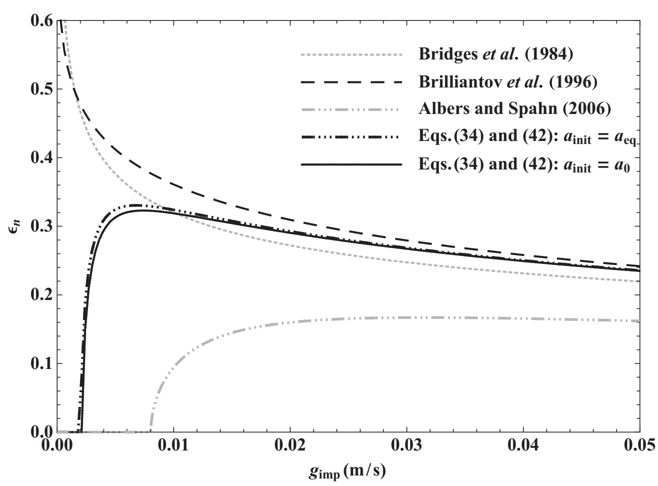

FIG. 2. Corrected version of Fig. 2. Coefficient of restitution ε as a function of the impact rate $g_{\rm imp}$ for same-sized icy particles of radius $R = 2$ cm ($R_{\rm eff} = 1$ cm) for different model realizations. As expected and in general agreement with experiments [40,41], adhesive collisions are more dissipative than purely viscoelastic ones (cf. the dashed black and the solid and dashed-dotted lines). Moreover, below a certain impact speed, here $g_{\rm cr} \approx 2$ mm/s, particles stick together instead of rebouncing in the case of restitution for $g_{\rm imp} > g_{\rm cr}$. Results of [39] are shown as an exemplary comparison.

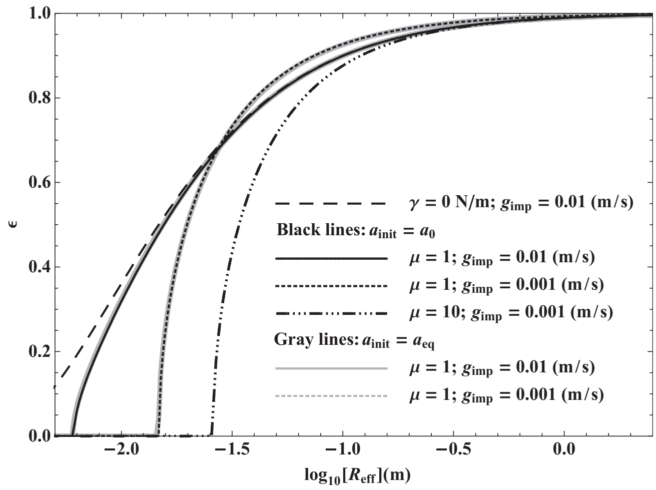

FIG. 3. Corrected version of Fig. 3. The coefficient of restitution ε as a function of the effective particle radius R_{eff} for icy particles colliding at a fixed impact rate g_{imp}. Restitution becomes dominant with increasing effective particle radius. Slower impacts and size ratios different from one favor aggregation. In the limit of large spheres, adhesive effects are negligible, and collisions are purely elastic.

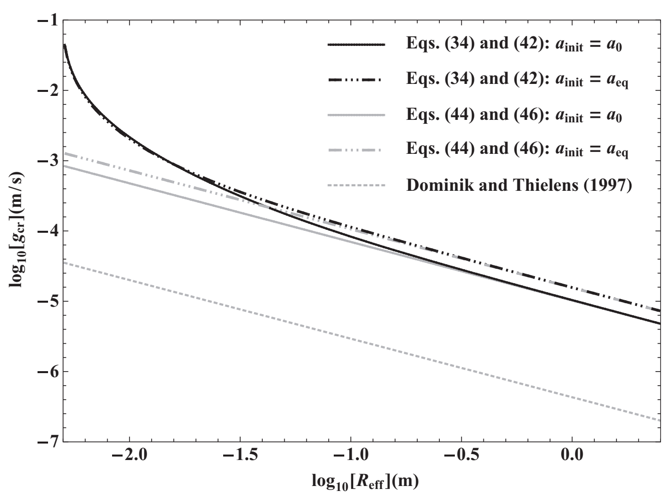

FIG. 4. Corrected version of Fig. 4. Critical velocity g_{cr} as a function of the effective particle radius for the collision of same-sized icy particles. The analytical estimate given by Eqs. (44) and (46) is compared to the exact numerical results given by Eq. (34). The critical impact rate distinguishes restitutive from aggregative collisions, where the domain of restitution is above the respective and the domain of aggregation below each respective curve. The results from Refs. [23,37] show a qualitatively similar particle size dependence of g_{cr}.