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Erratum

Anisotropic colloids through non-trivial buckling

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The initial article presents experimental results on thin colloidal shells under constraint, numerical simulations of deformed spherical surfaces and calculations that are to be done in order to make the link between the 2D parameters of the numerical simulations and the 3D experimental parameters. The erratum concerns this latter aspect.

First group of corrections. Some calculations were erroneous, due to a misinterpretation of ref. [33].

The two equations between (2) and (3) of our original article,

$$A = \frac{1+2\sigma}{(1+\sigma)^2} Ed$$

and

$$\nu = \frac{\sigma}{1+\sigma},$$

are to be replaced with the following two equations:

$$A = Ed$$

and

$$\nu = \sigma.$$

This can be simply shown by writing Hooke's law with negligible out-of-plane constraints (see, *e.g.*, appendix A of Marmottant *et al.*, submitted to J. Acoust. Soc. Am.). It leads, for eq. (3)

$$\gamma = 12\left(1-\nu^2\right)\left(\frac{R}{d}\right)^2.$$

Another consequence is that $\left[1-\frac{2\nu^2}{1-\nu}\right]$ is to be replaced with $\left[1-\nu^2\right]$ in the equations between eq. (6) and eq. (7).

Second group of corrections. Mean curvature and related bending constant have diverging definitions between mathematicians/mechanicians on the one side, and the soft matter community (physics of vesicles) on the other side, which imposes to be very clear about which convention is used. Equation (1) was written in the soft matter convention, where mean curvature $c = \frac{1}{R_1} + \frac{1}{R_2}$ is the sum of the curvatures in the principal planes (and not the half-sum as considered by mathematicians). With this convention, the spontaneous curvature value effectively taken for the simulations was $c_0 = 2/R$ and not $1/R$ as written, which indeed corresponds to an initial constraint-free state.

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A similar confusion between the conventions of the two communities led to miscalculate the values of $\gamma = \frac{AR^2}{\kappa}$ effectively used in (still valid) simulations. All numerical values of γ displayed in our paper have thus to be multiplied by a factor 4.

As a consequence, the values of the corresponding tridimensional parameter $\frac{d}{R}$ displayed in text and captions have to be recalculated, using both the corrected equation (3) given in the previous paragraph of this erratum, and the corrected value of γ. All simulations having been performed at $\nu = 0.333$, corrections may be done by simply multiplying published values of $\frac{d}{R}$ by a factor $\frac{1}{\sqrt{3}} = 0.577$.

With these corrections, the two interpolating straight lines of fig. 10 have as equations: $\frac{\Delta V}{V} = 6\,\gamma^{-0.55}$ and $\frac{\Delta V}{V} = 3400\,\gamma^{-1}$, respectively, for the first-order and for the secondary buckling.