

Erratum: Simple Model for the Mechanics of Spider Webs [Phys. Rev. Lett. 104, 038102 (2010)]

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We have discovered that there is a typographical error in Eq. (3) of our Letter. All of our other results and conclusions are unaffected. The correct equation should be

$$\frac{F_{m+1}}{\bar{k}_m} = \left(\frac{1}{\bar{k}_{m-1}} + \frac{1}{\bar{k}_m} + \frac{\alpha^2}{\bar{K}} \right) F_m - \frac{F_{m-1}}{\bar{k}_{m-1}}.$$

In other words, we have to make the replacement $(\bar{k}_m, \bar{k}_{m+1}) \rightarrow (\bar{k}_{m-1}, \bar{k}_m)$ in the original equation to express the correct result. This is derived as follows. Denoting the extension from the natural length of (n, m) radial threads ΔL_m , the force F_m can be expressed as

$$F_m = \bar{K} \Delta L_m. \quad (1)$$

Using this ΔL_m , from a geometry consideration, we notice that the extension of (n, m) spiral threads can be expressed as $\Delta_m = \alpha(\Delta L_1 + \dots + \Delta L_m)$, i.e., $f_m = \bar{k}_m \Delta_m$. Then Eq. (4) in our Letter can be expressed with the aid of Eq. (1) as

$$F_{m+1} = F_m + \alpha^2 \frac{\bar{k}_m}{\bar{K}} (F_1 + \dots + F_m) \quad (2)$$

or

$$F_m = F_{m-1} + \alpha^2 \frac{\bar{k}_{m-1}}{\bar{K}} (F_1 + \dots + F_{m-1}). \quad (3)$$

By calculating the quantity, Eq. (2) divided by \bar{k}_m minus Eq. (3) divided by \bar{k}_{m-1} , we obtain the above correct expression.

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