Erratum: Efficiency of harvesting energy from colored noise by linear oscillators [Phys. Rev. E 88, 022124 (2013)]

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We report an error in the equations for the efficiency, namely, (4.8), (5.3), (5.7), and (5.8), in the original paper. The error stems from the combination of (4.5) and (4.6), where η_{me} was dropped and R_L^{-1} was kept, whereas the procedure should have been the other way around. The corrected equations follow:

$$\eta = \phi\eta_{me}\left(1 + \frac{b}{k_c}\frac{\langle V\xi\rangle_s}{\langle v\xi\rangle_s}\right), \tag{4.8}$$

$$\eta = \phi\eta_{me}\frac{1+\lambda\tau_p + b\tau_p}{1+\lambda\tau_p}, \tag{5.3}$$

$$\eta^W = \phi\eta_{me}, \tag{5.7}$$

$$\frac{\langle V^2\rangle_s^W}{R_L} = D\phi\eta_{me}. \tag{5.8}$$

As a consequence, Figs. 3(b) and 3(c) need to be replaced by the ones shown below, and two statements in the discussion of Fig. 3 need to be modified. First, the efficiency at maximum power η^* does not reach a plateau at intermediate values of k_c and k_v. Instead, η^* increases rapidly with k_c, and it decreases for small values of k_v and tends to zero for high k_v values. [Note that Fig. 3(b) reflects the expected physical limits for k_c and k_v, given by (4.4), since the efficiency must always be smaller than 1.] Second, to improve performance, it would be desirable to tune k_c to the highest possible value, taking into account the physical limit $\eta^* < 1$, and k_v to the lowest possible value, in contrast to tuning k_c and k_v to intermediate values, as stated in the original paper.

In addition, the differential equation for the colored noise included in the original version does not accurately describe the noise actually used in the simulations. This equation is not numbered in the original paper and can be found in the paragraph that follows Fig. 2. It should be corrected to read as follows:

$$\frac{d\xi}{dt} = -\xi\lambda + \sqrt{2a\lambda}\eta(t).$$

In the same paragraph there is an error in the description of the noise correlation. The correct description should be $\langle\eta(t)\eta(t')\rangle = \delta(t-t')$.

Finally, there is an error without physical implications in the third Hurwitz determinant, where a term was omitted. Equation (2.10d) should read

$$\Delta_3 = \frac{bw^2}{\tau_p^3} + (b^2 + k_c k_v)\frac{w^2}{\tau_p^2} + \frac{bw^4}{\tau_p} + \frac{bw^2 k_c k_v}{\tau_p}. \tag{2.10d}$$

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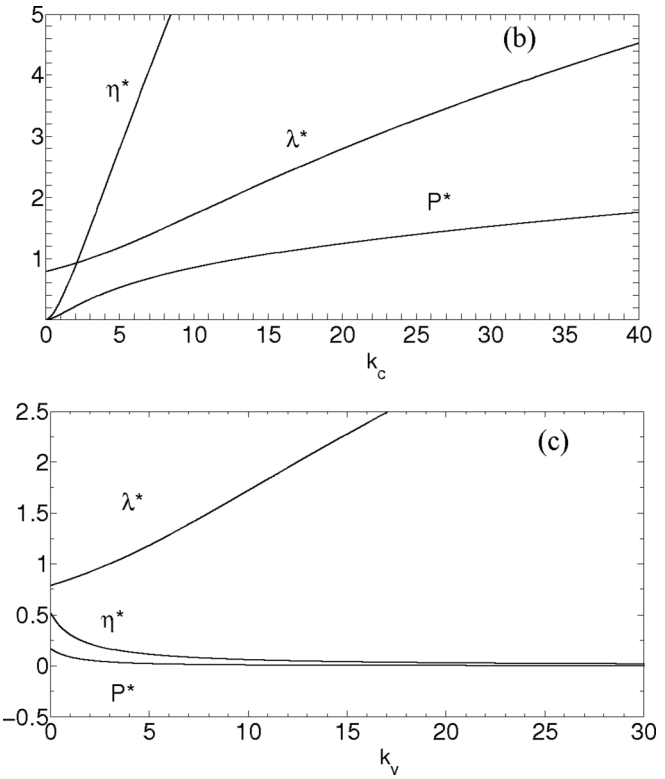

FIG. 3. Maximum net electrical power P^*, overall efficiency at maximum power η^*, and characteristic frequency of the noise at maximum power λ^*, as a function of k_c and k_v. In (b) the efficiency exceeds 1 as k_c increases, due to the fact that the parameter values were chosen to be the same as in the original paper. As discussed in the text, the physically acceptable regime corresponds to $\eta^* < 1$.