-symmetric cubic anharmonic oscillator as a physical model

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Corrigendum

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There is a factor of 2 error in equation (61) of this paper. Correcting this error leads to minor changes in equations (62) and (63). The corrected equations are

$$M(x_c) := \frac{m}{1+6\mu^{-4}\epsilon^2 x_c^2} = m(1 - 6\mu^{-4}\epsilon^2 x_c^2) + \mathcal{O}(\epsilon^4), \tag{61}$$

$$\frac{p_c^2}{2m} + \left(\frac{\mu^2}{2} + \frac{6\epsilon^2 E}{\mu^4}\right) x_c^2 - \frac{3\epsilon^2}{2\mu^2} x_c^4 = E, \tag{62}$$

$$E \ll E_\star := \frac{1}{12}\mu^6\epsilon^{-2}. \tag{63}$$

Therefore, the value of $E_\star$ given in the caption of figure 1 should be $25/3 \approx 8.3$. Equation (62) shows that the distortion of the elliptic shape of the phase space orbits of the unperturbed (harmonic oscillator) potential occurs at order ϵ^2 of the perturbation theory. This distortion is more pronounced for larger values of E as shown in figure 1. Note that this figure uses equation (59) which is free from the above-mentioned numerical error.

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