Erratum: Ion traps and the memory effect for periodic gravitational waves **[Phys. Rev. D **98**, 044037 (2018)]**

P.-M. Zhang, M. Cariglia, C. Duval, M. Elbistan, G. W. Gibbons, and P. A. Horvathy

(Received 3 October 2018; published 19 October 2018)

DOI: [10.1103/PhysRevD.98.089901](https://doi.org/10.1103/PhysRevD.98.089901)

The last paragraph of Sec. VI (Lagrange points in celestial mechanics) is misleading and should be corrected. In fact, the eigenvalues λ_i , $i = 1, 2$, in (6.5) are manifestly real and negative for all μ within our range (6.3). The apparent contradiction with Sec. III, where no additional constraint is required, is then resolved by noting that the solutions (3.15) cannot be naively used here. Putting $c = \sqrt{1 - 3\mu(1 - \mu)}$ and $\Delta = 9c^2 - 8 = 1 - 27\mu(1 - \mu)$, the chiral decomposition (3.10a) and (3.10b) has coefficients

$$\alpha_{\pm} = \frac{1}{4}(4 - 3c \mp \sqrt{\Delta}), \quad \beta_{\pm} = \frac{1}{4}(4 + 3c \mp \sqrt{\Delta}), \quad (1)$$

which are real when $\Delta \geq 0$, i.e., when $\mu(1 - \mu) \leq \frac{1}{27}$. Then the Hamiltonian H and the symplectic 2-form σ are decomposed as

$$H = \frac{\sqrt{\Delta}}{16} \left[(\sqrt{\Delta} - 4 + 3c)X_+^2 X_+^2 + (\sqrt{\Delta} - 4 - 3c)X_+^1 X_+^1 + (\sqrt{\Delta} + 4 - 3c)X_-^2 X_-^2 + (\sqrt{\Delta} + 4 + 3c)X_-^1 X_-^1 \right], \quad (2a)$$

$$\sigma = \frac{\sqrt{\Delta}}{2} [dX_+^1 \wedge dX_+^2 - dX_-^1 \wedge dX_-^2], \quad (2b)$$

whose regularity requires $\Delta \neq 0$, i.e., when the refined condition (6.8),

$$\mu(1 - \mu) < \frac{1}{27}, \quad (3)$$

holds. Then the corresponding solutions

$$\hat{\xi} = A \cos(\sqrt{\alpha_+ \beta_+} t) + B \sin(\sqrt{\alpha_+ \beta_+} t) + C \cos(\sqrt{\alpha_- \beta_-} t) + D \sin(\sqrt{\alpha_- \beta_-} t), \quad (4a)$$

$$\hat{\eta} = \sqrt{\frac{\beta_+}{\alpha_+}} \left(-A \sin(\sqrt{\alpha_+ \beta_+} t) + B \cos(\sqrt{\alpha_+ \beta_+} t) \right) + \sqrt{\frac{\beta_-}{\alpha_-}} \left(-C \sin(\sqrt{\alpha_- \beta_-} t) + D \cos(\sqrt{\alpha_- \beta_-} t) \right) \quad (4b)$$

are manifestly bounded, because $\Delta < 1$ implies $\alpha_{\pm} \beta_{\pm} = \frac{1}{2}(1 \mp \sqrt{\Delta}) > 0$.

We are indebted to Matt Kalinski for calling our attention to these problems, which, however, concern the consistency of two different approaches and do not change any of the conclusions of our paper.