

**Erratum: Do we have unitary and (super)renormalizable
quantum gravity below the Planck scale?
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We correct the formulation of physical interpretation regarding the stability of metric perturbations in higher-derivative theories of gravity.

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In Ref. [1], we considered the stability of the cosmological solutions in the higher-derivative theory with the action

$$S_{4dQG} = \int d^4x \sqrt{-g} \left\{ -\frac{\kappa}{16\pi} R + a_1 C^2 + a_2 E + a_3 \square R + a_4 R^2 \right\}. \quad (1)$$

In the case $a_1 < 0$ and $\kappa = M_P^2 > 0$, we correctly found that the growths of the metric perturbations start only for the initial frequencies of the Planck order of magnitude. Also, we correctly noted that for $a_1 > 0$ and $\kappa = M_P^2 > 0$ there is no Planck threshold, and the overproduction of gravitons takes place for any initial frequency. However, the correct interpretation of this instability is the emergence of tachyon modes for the negative-square mass of the field. The case that we described in the paper corresponds to the situation $a_1 > 0$ and $\kappa = -M_P^2 < 0$, when the massless graviton becomes a ghost and the massive graviton is a normal field. Now, we have additionally checked, using the method described in Ref. [1], that our conclusions remain completely correct, also, in this case.

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[1] F. d. O. Salles and I. L. Shapiro, *Phys. Rev. D* **89**, 084054 (2014).