Erratum: Scalar-multi-tensorial equivalence for higher order
 $f(R, \nabla_\mu R, \nabla_{\mu_1} \nabla_{\mu_2} R, \dots, \nabla_{\mu_1} \dots \nabla_{\mu_n} R)$ theories of gravity
[Phys. Rev. D **93, 124034 (2016)]**

R. R. Cuzinatto, C. A. M. de Melo, L. G. Medeiros, and P. J. Pompeia

(Received 19 June 2018; published 5 July 2018)

DOI: [10.1103/PhysRevD.98.029901](https://doi.org/10.1103/PhysRevD.98.029901)

It has come to our attention that some equations presented in our paper were incorrectly displayed with the absence of some terms. The correct results are presented below, but the main conclusions and the general structure proposed in the paper remain the same. The corrections are as follows.

(i) Equation (16) reads

$$\Phi G_{\mu\nu} + \square \Phi g_{\mu\nu} - \nabla_\mu \nabla_\nu \Phi + \frac{1}{2} g_{\mu\nu} U - v_{\mu\nu} = \kappa T_{\mu\nu}, \quad (1)$$

where $v_{\mu\nu} \equiv \frac{\delta U}{\delta g^{\mu\nu}}$.

(ii) The last equation of Sec. I [equation after Eq. (20)] should be

$$3\square\Phi + 2U - \Phi \frac{\partial U}{\partial \Phi} - v = \kappa T, \quad (2)$$

where $v \equiv g^{\mu\nu} v_{\mu\nu}$.

(iii) Equation (42) reads

$$\Phi G_{\mu\nu} + \frac{3}{2} \frac{1}{\Phi} \left(\overset{\circ}{\nabla}_\mu \Phi \overset{\circ}{\nabla}_\nu \Phi - \frac{1}{2} g_{\mu\nu} \overset{\circ}{\nabla}_\rho \Phi \overset{\circ}{\nabla}^\rho \Phi \right) - (\nabla_\mu \nabla_\nu \Phi - g_{\mu\nu} \square \Phi) + \frac{1}{2} g_{\mu\nu} U - v_{\mu\nu} = \kappa T_{\mu\nu}, \quad (3)$$

with $v_{\mu\nu}$ defined as above.

(iv) The last equation of Sec. III [equation after Eq. (46)] should be

$$2U - \Phi \frac{\partial U}{\partial \Phi} - v = \kappa T, \quad (4)$$

with v defined as above.

(v) The first equation of the pair that appears before Eq. (51) reads

$$-3\square\Phi - \kappa T - 2 \left[\frac{1}{2c_0} (\Phi + \nabla_\nu \phi^\nu - 1)^2 + \frac{\phi^\mu \phi_\mu}{2c_1} \right] + \Phi \frac{1}{c_0} (\Phi + \nabla_\beta \phi^\beta - 1) - v = 0, \quad (5)$$

where

$$v = 2\nabla_\gamma \left(\frac{1}{c_0} (\Phi + \nabla_\sigma \phi^\sigma - 1) \phi^\gamma \right) + \frac{\phi^\mu \phi_\mu}{2c_1}. \quad (6)$$

(vi) The first equation of the pair that appears before Sec. IV C is

$$\Phi = \frac{c_0}{\nabla_\beta \phi^\beta - 1} \left[\kappa T - v - \frac{\phi^\mu \phi_\mu}{c_1} - \frac{1}{c_0} (\nabla_\beta \phi^\beta - 1)^2 \right],$$

where v is given by Eq. (6) above.