

Erratum: QCD with an infrared fixed point and a dilaton [Phys. Rev. D **110**, 014048 (2024)]

Roman Zwicky 

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We report an error in extending the dilaton effective theory to d dimensions in Ref. [1]. No results are affected, since the d -dimensional effective Lagrangian was not used in any derivation. All results that depend on the spacetime dimension d were obtained without reference to this Lagrangian.

Following [2,3], we define the fields [$d_\phi \equiv (d-2)/2$],

$$\hat{\chi} \equiv \exp(-D/F_D), \quad \chi \equiv F_D/d_\phi \hat{\chi}^{d_\phi}, \quad (1)$$

where D is the dilaton and F_D its decay constant. These fields transform as [$D \rightarrow D - F_D \alpha(x)$],

$$\hat{\chi} \rightarrow e^{\alpha(x)} \hat{\chi}, \quad \chi \rightarrow e^{\alpha(x)d_\phi} \chi, \quad (2)$$

under Weyl transformation $g_{\mu\nu} \rightarrow e^{-2\alpha(x)} g_{\mu\nu}$ such that χ takes on the role of the free field (and $\hat{\chi}$ is the compensator). With these definitions, Eqs. (2.16) and (2.17) of [1] must be replaced by

$$\mathcal{L}_{\text{kin}}^{(\pi)} = \frac{F_\pi^2}{4} \hat{\chi}^{d-2} \text{Tr}[\partial^\mu U \partial_\mu U^\dagger], \quad \mathcal{L}_{\text{kin}}^{(D)} = \frac{1}{2} (\partial\chi)^2, \quad (3)$$

and

$$\mathcal{L}_d^R = -\frac{d_\phi}{4(d-1)} R \chi^2 \xrightarrow{d=4} -\frac{1}{12} R \chi^2, \quad (4)$$

with $\chi \rightarrow F_D \exp(-D/F_D)$ on the left-hand side since $d=4$ is assumed. The important point is that, with Eqs. (3) and (4), the Weyl transformation (2) is correctly reproduced in d -dimensions [3].

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