Erratum: Impacts of non-geometric moduli on effective theory of 5D supergravity

Yutaka Sakamura^{a,b} and Yusuke Yamada^c

^a*KEK Theory Center, Institute of Particle and Nuclear Studies, KEK, Tsukuba, Ibaraki 305-0801, Japan*

^b*Department of Particles and Nuclear Physics, The Graduate University for Advanced Studies (Sokendai), Tsukuba, Ibaraki 305-0801, Japan*

^c*Department of Physics, Waseda University, Tokyo 169-8555, Japan*

E-mail: sakamura@post.kek.jp, yuusuke-yamada@asagi.waseda.jp

ERRATUM TO: [JHEP11\(2013\)090](#)

ABSTRACT: We correct the relation between the physical size of the extra dimension and the VEV of the moduli, and the expressions that follow from it. Errors of the sub-leading terms in section 4 are also corrected.

ARXIV EPRINT: [1307.5585](#)

1. The two sentences from the seventh line below eq. (3.2) should be corrected as “In our derivation of (3.1), it follows that $\langle \phi_C \rangle = \langle \Phi_C^{2/3} \rangle$ [16]. Therefore, we find that $L_{\text{phys}} = (-\langle \Omega_{\text{eff}} \rangle / 3)^{3/2} / M_{\text{Pl}}$.”
2. In the first item below eq. (3.6), the relation $\text{Re} \langle T_{\text{rad}} \rangle = \langle \hat{\mathcal{N}}^{1/3} \rangle$ should be replaced with $L_{\text{phys}} = \langle \hat{\mathcal{N}}^{1/2} \rangle = (\text{Re} \langle T_{\text{rad}} \rangle)^{3/2}$, and the KK mass $m_{\text{KK}} = \pi / \langle \hat{\mathcal{N}}^{1/3} \rangle$ should be corrected as $m_{\text{KK}} = \pi / \langle \hat{\mathcal{N}}^{1/2} \rangle$.
3. In eqs. (4.1) and (4.13), the argument of $\mathcal{Z}$ should read $d_a \cdot \text{Re } T$.
4. Eq. (4.12) should read

$$\Omega_{\text{eff}} = -3\hat{\mathcal{N}}^{1/3} + \frac{(n_V - \bar{n}_H + 1)\zeta(3)}{32\pi^2\hat{\mathcal{N}}^{2/3}} + \dots,$$

5. The second line below eq. (4.13), $L_{\text{phys}} = \langle \hat{\mathcal{N}}^{1/3} \rangle \gg 1$ should read $L_{\text{phys}} = \langle \hat{\mathcal{N}}^{1/2} \rangle \gg 1$.

6. Eq. (4.17) should read

$$\xi_{I_o} \equiv \frac{\partial \xi}{\partial T^{I_o}} = \sum_a \frac{n_a d_{aI_o} (d_a \cdot \text{Re } T)}{16\pi^2} \ln \left(1 - e^{-2|d_a \cdot \text{Re } T|} \right).$$

7. Eq. (4.20) should read

$$\begin{aligned} V_{\text{pot}} &= e^K \left(D_I W K^{I\bar{J}} D_{\bar{J}} \bar{W} - 3|W|^2 \right) \\ &= \frac{1}{\hat{\mathcal{N}}} \left\{ \frac{2\hat{\mathcal{N}}(aA)^2 e^{-2a\tau_s}}{3C_s\tau_s \left(1 - \frac{\delta}{6}\right)} + 4a\tau_s \left(1 + \frac{\epsilon}{3} + \frac{\delta}{6}\right) W_0 A e^{-a\tau_s} \cos(a\rho_s) \right\} \\ &\quad + \frac{6\xi W_0^2}{\hat{\mathcal{N}}^2} \left\{ 1 - \frac{2C_s\tau_s^3}{3\xi} \left(\epsilon - \frac{\delta}{4} \right) \right\} + \dots, \end{aligned}$$

8. eq. (4.22) should read

$$\begin{aligned} \langle \tau_b^3 \rangle &\simeq \langle \hat{\mathcal{N}} \rangle = \frac{3\xi W_0 e^{a\langle \tau_s \rangle}}{a\langle \tau_s \rangle A} \left\{ 1 - \frac{\epsilon}{3} \left(1 + \frac{2C_s\tau_s^3}{\xi} \right) - \frac{\delta}{6} \left(1 - \frac{C_s\tau_s^3}{\xi} \right) \right\}, \\ \langle \tau_s \rangle &\simeq \left(\frac{\xi}{C_s} \right)^{1/3} \left\{ 1 - \frac{2\epsilon}{3} \left(1 + \frac{C_s\tau_s^3}{3\xi} \right) - \frac{\delta}{6} \left(1 - \frac{C_s\tau_s^3}{3\xi} \right) \right\} \equiv \tau_s^{(0)}, \\ \cos\langle \rho_s \rangle &= -\text{sign}(W_0 A), \end{aligned}$$

9. In the fifth line below eq. (4.23), $L_{\text{phys}} = \langle \hat{\mathcal{N}}^{1/3} \rangle$ should be replaced with $L_{\text{phys}} = \langle \hat{\mathcal{N}}^{1/2} \rangle$.

10. Eq. (4.24) should read

$$\begin{aligned} m_{\tau_b} &\simeq \left\langle \frac{12\sqrt{6}\xi W_0}{\hat{\mathcal{N}}\sqrt{a\tau_s}} \left\{ 1 + \frac{C_s\tau_s^3}{9\xi} \left(\epsilon + \frac{11}{4}\delta - \zeta \right) + \frac{1}{9}(-8\epsilon + 3\delta + \zeta) \right\} \right\rangle, \\ m_{\rho_b} &\simeq 0, \quad m_{\tau_s}, m_{\rho_s} \simeq \left\langle \frac{4a\tau_s W_0}{\sqrt{\hat{\mathcal{N}}}} \left\{ 1 + \frac{\epsilon}{3} + \frac{\delta}{12} \right\} \right\rangle, \end{aligned}$$

where $\zeta \equiv \xi'''/C_s$.

11. Eq. (4.25) should be replaced with

$$V_{\text{min}} \simeq - \left\langle \frac{18\xi W_0^2}{(2a\tau_s + 1)\hat{\mathcal{N}}^2} \right\rangle.$$

12. Eq. (4.28) should read

$$\langle \tau_s \rangle = \tau_s^{(0)} + \frac{3}{2a^2\tau_s^{(0)}} \left\{ 1 - \frac{\epsilon}{9} \left(2 + \frac{5C_s\tau_s^{(0)3}}{\xi} \right) + \frac{\delta}{9} \left(1 + \frac{C_s\tau_s^{(0)3}}{\xi} \right) \right\}.$$

13. Eq. (4.29) should read

$$\left\langle \frac{F^{T_s}}{T_s + \bar{T}_s} \right\rangle \simeq - \left\langle \frac{K^{T_s \bar{T}_s} W_{\bar{T}_s} + K^{T_s \bar{I}} K_{\bar{I}} \bar{W}}{2\tau_s \sqrt{\hat{\mathcal{N}}}} \right\rangle \simeq \frac{m_{3/2}}{a\tau_s^{(0)}} \ll \left\langle \frac{F^{T_b}}{T_b + \bar{T}_b} \right\rangle.$$

14. Eq. (4.30) should read

$$\left\langle \frac{F^{\phi_C}}{\phi_C} \right\rangle = \frac{1}{3} \langle K_I F^I \rangle + m_{3/2} = \mathcal{O} \left(\frac{m_{3/2}}{\hat{\mathcal{N}}^{4/3}} \right) \ll \left\langle \frac{F^{T_s}}{T_s + \bar{T}_s} \right\rangle,$$

15. Eq. (4.31) should read

$$M_r = \langle F^I \partial_I \ln(\text{Re } f_{\text{eff}}^r) \rangle \simeq \left\langle \frac{F^{T_s}}{T_s + \bar{T}_s} \right\rangle \simeq \frac{m_{3/2}}{a\tau_s^{(0)}}.$$

16. Table 2 should be corrected as

M_{Pl}	m_{τ_s}	m_{ρ_s}	m_{KK}	$m_{3/2}$
1	$\mathcal{O} \left(\frac{\ln L_{\text{phys}}}{L_{\text{phys}}} \right)$	$\mathcal{O} \left(\frac{\ln L_{\text{phys}}}{L_{\text{phys}}} \right)$	$\mathcal{O} \left(\frac{1}{L_{\text{phys}}} \right)$	$\mathcal{O} \left(\frac{1}{L_{\text{phys}}} \right)$
m_{Q_a}	M_r	m_{τ_b}	m_q	m_{ρ_b}
$\lesssim \mathcal{O} \left(\frac{1}{L_{\text{phys}}} \right)$	$\mathcal{O} \left(\frac{1}{L_{\text{phys}} \ln L_{\text{phys}}} \right)$	$\mathcal{O} \left(\frac{1}{L_{\text{phys}}^2} \right)$	$\mathcal{O} \left(\frac{1}{L_{\text{phys}}^2} \right)$	$\simeq 0$

17. The paragraph below eq. (4.37) should be replaced with “The mass scales of this model in the unit of M_{Pl} are summarized in table 2. We have assumed that $W_0 = \mathcal{O}(1)$ there.”

18. The last three sentences in section 4 are replaced with “Comparing our spectrum in table 2 with (4.40), we find that the nongeometric moduli τ_s and ρ_s are heavier than the KK mass scale $m_{\text{KK}} = \pi / \langle \hat{\mathcal{N}}^{1/2} \rangle$ in contrast to (4.40). Thus the expressions of their masses in our analysis are valid only when $W_0 < \mathcal{O}(1/a \langle \tau_s \rangle)$, although our mechanism that realizes a large extra dimension still works even if $W_0 = \mathcal{O}(1)$.”

19. In eq. (B.3), the definition of T_R should be corrected as

$$T_R \equiv \bigoplus_a (-2d_a \cdot \text{Re } T \otimes \mathbf{1}_{n_a}),$$

Open Access. This article is distributed under the terms of the Creative Commons Attribution License ([CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/)), which permits any use, distribution and reproduction in any medium, provided the original author(s) and source are credited.