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Errata for "AdS/CFT Duality User Guide"

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Thanks to Jean Vaillancourt [JV] and the others.

1 Print edition

Chap. 3

- p.38, after Eq. (2.82) [JV]: $\sqrt{-g} = r^2 \sin\theta$.
- p.39 [Masaki Honda, Yoh Kobayashi, JV]:
  - When $\sqrt{G}M > Q$, two horizons exist.
  - When $\sqrt{G}M < Q$, there is no horizon since (3.54) becomes complex.
  - The limiting case $\sqrt{G}M = Q$ or $r_+ = r_-$ is called the *extreme black hole*.

Chap. 5

- p.67, after Eq. (5.14) [JV]: we write the dependence...

Chap. 7

- p.105, footnote 3 [JV]: From the field theory...
- p.107, Eq. (7.22) [JV]:

$$Z_{\mathrm{B}} = \left(\sum_{n_1=0}^{\infty} e^{-\beta n_1 \omega_1} \right) \times \cdots = \prod_{i=1}^{\infty} \frac{1}{1 - e^{-\beta \omega_i}} \ . \tag{1}$$

- p.107, Eq. (7.31) [Yoh Kobayashi, Yoshiki Minami, Seiga Sato, JV]:

$$Z_{\mathrm{F}} = (1 + e^{-\beta\omega_1}) \times \cdots = \prod_{i=1}^{\infty} (1 + e^{-\beta\omega_i}) \ , \tag{2}$$

Chap. 8

- p.128, footnote [JV]: Note the factor of the dilat ~~i~~ on ...

Chap. 9

- p.148, Eq. (9.83) [JV]:

$$\text{external source } \phi^{(0)} \to \text{response } \delta\langle O \rangle \ . \tag{3}$$

- p.154, Eq. (9.121) [JV]:

$$T\partial_\mu (s u^\mu) \overset{RF}{=} -\tau^{\langle ij \rangle} \sigma_{ij} - \tau\theta \ , \tag{4}$$

Chap. 10

- p.188, second paragraph [JV]: ...for $p = 4$, $\varepsilon \propto \lambda N_c^2 T^6 \propto N_c^3 T^6$.

Chap. 11

- p.193, Eqs. (11.33) and (11.34) [JV]: every r_0 should be replaced by $\tilde{r}_0$.

Chap. 12

- p.203: 2 lines before Eq. (12.11) [JV]: ...we solve ~~the~~ the perturbation equation ...
- p.209, Eq. (12.26) [JV]:

$$\frac{1}{\sqrt{-g}} \partial_M (\sqrt{-g} g^{MN} \partial_N \phi) = 0 \tag{5}$$

- p.212, middle [JV]: • Suppose that the particles ...fin ~~i~~ al momentum ...
- p.217, 2 lines before Eq. (12.53) [JV]: ...are related by $\varepsilon = 3P$, ...
- p.219, 3 lines before Eq. (12.56) [JV]: ...the α'- corrections from ...
- p.226, Eq. (12.75) [JV]:

$$\begin{aligned} \mathsf{S}_2 = \int_0^1 du \left[\frac{h}{u^3} \left(\frac{3}{2} \phi'_{-k} \cdot \phi'_k + 2\phi_{-k} \cdot \phi''_k \right) - \frac{8}{u^4} \phi_{-k} \cdot \phi'_k \right. \\ \left. + \left(\frac{\mathfrak{w}^2 - \mathfrak{q}^2 h}{2\pi^2 u^3 h} + \frac{4}{u^5} \right) \phi_{-k} \cdot \phi_k \right] , \end{aligned} \tag{6}$$

- p.234, 2 lines above Eq. (12.136) [JV]: Near the horizon, Eq. (12. 133) becomes ...
- p.241, Eq. (12.193) [JV]:

$$\frac{F}{C} = 1 + \frac{i}{4\pi} \mathfrak{w} \ln \frac{4u^4}{1 - u^4} - \frac{\mathfrak{q}^2}{4\pi^2} \ln \frac{2u^2}{1 + u^2} + \cdots . \tag{7}$$

Chap. 13

- p.253, Eq. (13.50) [JV]:

$$m(0, H) \propto \ldots \propto H^{(d_s - y_h)/y_h} . \tag{8}$$

- p.253, 2 lines after Eq. (13.50) [JV]: ...we choose ~~s~~ $b^{y_h} H = 1$.

Chap. 14

- p.268, 2 lines before Eq. (14.3) [JV]: The first one is the Schwarzschild- ~~S~~ AdS_5 ($SAdS_5$) black hole:
- p.277, Eq. (14.43) [JV]:

$$A_0'' - \frac{2|\Psi|^2 L^2}{u^2 h} A_0 = 0 , \tag{9}$$

- p.280, Eq. (14.53) [JV]:

$$\frac{1}{h} (h A_x')' + \left(\frac{\omega^2}{\mathsf{T}^2 h^2} - \frac{2\Psi^2 L^2}{u^2 h} \right) A_x = 0 . \tag{10}$$

- p.281, line 3 of paragraph 4 [JV]: For the holographic superconductor, a magnetic field can ~~can~~ penetrate superconductors.
- p.288, Eqs. (14.84) and (14.85) [JV]: ψ_1^2 should be replaced by $\psi_1^2 L^2$.

2 ArXiv edition (1409.3575v4)

Chap. 4

- p.57, Eq. (4.30) [Kensuke Akita, Sosuke Imai, Seiga Sato]:

$$\phi_A \to U \phi_A U^{-1} \ . \tag{11}$$

- p.57, Eq. (4.32) [Sosuke Imai]:

$$i[D_\mu, D_\nu]\phi = \{\partial_\mu A_\nu - \partial_\nu A_\mu - i[A_\mu, A_\nu]\}\, \phi \ . \tag{12}$$

- p.57, Eq. (4.33) [Sosuke Imai]:

$$F_{\mu\nu} = +i[D_\mu, D_\nu] = \partial_\mu A_\nu - \partial_\nu A_\mu - i[A_\mu, A_\nu] \ . \tag{13}$$

Chap. 15

- Prob. 15.14, Eq. (15.30) [Ping Kwan Man]:

$$x(r) = +v r_0^2 L^2 \int^r \frac{dr}{r^4 - r_0^4} \tag{14}$$

$$= \frac{L^2}{2r_0} v \left\{ \frac{\pi}{2} - \tan^{-1}\left(\frac{r}{r_0}\right) - \coth^{-1}\left(\frac{r}{r_0}\right) \right\} \ , \tag{15}$$

where the integration constant is chosen so that $x(r = \infty) = 0$.