Basic concepts in string theory, R. Blumenhagen, D. Lüst, S. Theisen (Springer): Errata

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Colors red and blue are respectively used to highlight the error and its correction (if necessary).

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- p. 205 below eq. (8.34): "built on the $|\bar{a}\rangle$ ground state" → $|\dot{a}\rangle$
- p. 208 sec. 8.4 §1: "The ghost action was than" → then
- p. 233 above eq. (9.24): "Expressing ψ' though ψ" → through

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- p. 8, eq. (2.3): $\dot{x}^2 = \eta_{\mu\nu}\, x^\mu\, x^\nu \to \dot{x}^2 = \eta_{\mu\nu}\, \dot{x}^\mu\, \dot{x}^\nu$
- p. 18, eq. (2.43): $(\xi, P^\dagger t_0) = (P\xi, t_0) \to (\xi|P^\dagger t_0) = (P\xi|t_0)$, for consistency with chapter 6
- p. 19, eq. (2.50):
$$4\partial_+\partial_- X^\mu = 0 \quad\longrightarrow\quad -4\partial_+\partial_- X^\mu = 0$$
- p. 50, eq. (3.58): $X^\mu(l - \sigma, \tau) \to X^\mu(\ell - \sigma, \tau)$
- p. 27, eq. (2.93):
$$\int_0^\pi \mathrm{d}\sigma \quad\longrightarrow\quad \int_0^\ell \mathrm{d}\sigma$$
- p. 66, eq. (4.12):
$$\phi_{\text{plane}}(z) = \sum_{n\in\mathbf{Z}} \phi_n z^{-n-h} \quad\longrightarrow\quad \phi_{\text{plane}}(z) = \sum_{n+h\in\mathbf{Z}} \phi_n z^{-n-h}$$
in view of comment below (4.13) (another possibility is to not write yet the range of the sum). Should eq. (4.11) also be fixed?
- p. 71, eq. (4.38): "Comparing Eq. (4.58b) with Eq. (4.9)" → (4.37)
- p. 70, 74: the definition of the adjoint is confusing: (3.34) looks incompatible with (4.55), and the definition $\langle\phi_{\text{out}}|$ as the adjoint of $|\phi_{\text{in}}\rangle$ (to compare with [2, p. 203]).

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- p. 79, below eq. (4.45): "For a given s" $\to c$
- p. 88, §1; p 109, below eq. (5.13): "$SL(2,\mathbb{Z})$ vacuum invariant vacuum" $\to SL(2,\mathbb{C})$
- p. 90, eq. (4.126):

$$\oint \frac{\mathrm{d}z}{2\pi i}\, i\partial X^\mu(z) :\mathrm{e}^{ik\cdot X(z,\bar z)}: \quad \longrightarrow \quad \oint \frac{\mathrm{d}w}{2\pi i}\, i\partial X^\mu(w) :\mathrm{e}^{ik\cdot X(z,\bar z)}:$$

- p. 114, eq. (5.38): I am not sure if $\{Q_B, c_n\}$ is correct[1]
- p. 128, below eq. (6.12): extraneous tab
- p. 141–2: The integral is written over the moduli space $\mathcal{M}_g$, but I would expect $\mathcal{T}_g$ instead, as defined in (6.47) above ([1, (14.95)] for comparison). Then, I would expect to see $\mathcal{M}_g$ instead of $\mathcal{F}_g$ (which has not been defined anywhere before its use), except if one wants to stress that any region equivalent to $\mathcal{M}_g$ would be fine.

  The two next points include the correction $\mathcal{M}_g \to \mathcal{T}_g$ (but not $\mathcal{F}_g \to \mathcal{M}_g$).

- p. 141, eq. (6.52, 54):

$$\int_{\mathcal{M}_g} \prod_i \mathrm{d}\tau_i^2 \quad \longrightarrow \quad \int_{\mathcal{T}_g} \prod_i \mathrm{d}^2\tau_i$$

- p. 142 below eq. (6.54): "we can replace $\frac{1}{|\mathrm{MCG}|}\int_{\mathcal{M}_g}\prod_i \mathrm{d}\tau_i$ by an integral over a fundamental region." $\to$ "we can replace $\frac{1}{|\mathrm{MCG}|}\int_{\mathcal{T}_g}\prod_i \mathrm{d}^2\tau_i$ by an integral over a fundamental region $\mathcal{F}_g$."
- p. 142, eq. (6.55): $\mathrm{d}\tau_i \to \mathrm{d}^2\tau_i$
- p. 143, eq. (6.62):

$$\int_{\mathcal{F}_g} \mathrm{d}^2 \prod_i \tau_i \quad \longrightarrow \quad \int_{\mathcal{F}_g} \prod_i \mathrm{d}^2\tau_i$$

- p. 160, eq. (6.120):

$$\widetilde{\mathcal{A}} = \cdots \mathrm{e}^{i\theta(L_0-\bar L_0)}\,|B\rangle \quad \longrightarrow \quad |A\rangle$$

- p. 510, eq. (14.262):

$$\delta e^a = \Lambda^a{}_b e^a \quad \longrightarrow \quad \delta e^a = \Lambda^a{}_b e^b$$

- p. 591, above eq. (16.8): $\alpha^\mu_{-1}\bar\alpha^\nu_{-1}\,|k\rangle \to \bar\alpha^\mu_{-1}\,\alpha^\nu_{-1}\,|k\rangle$ for consistency with eq. (16.8)
- p. 592, §1: "e.g. $\epsilon^{(D)}_{\mu\nu}\epsilon^{(G)\mu\nu} = 0$ for $G = h, B$"
- p. 690, below eq. (18.26): $\tilde F^2_{(p+2)} = \tilde F_{M_0\ldots M_{p+2}}\tilde F^{M_0\ldots M_{p+2}} \to \tilde F_{M_0\ldots M_{p+1}}\tilde F^{M_0\ldots M_{p+1}}$

References

[1] M. Nakahara. *Geometry, Topology and Physics*. 2nd edition. Institute of Physics Publishing, June 2003.

[2] J. Polchinski. *String Theory: Volume 1, An Introduction to the Bosonic String*. Cambridge University Press, June 2005.

[1]See https://physics.stackexchange.com/questions/280864.