Errata

“An Introduction to Gauge-Higgs Unification”

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Chapter 1

p. 3, 11th line from the bottom: “Brown” should be ”Brout”.

Chapter 7

p. 122, Eq. (7.38), in the second relation

$$\langle\tilde{\Phi}\rangle = \begin{pmatrix} -w^* \\ 0 \\ 0 \\ 0 \end{pmatrix} \quad \text{should be} \quad \langle\tilde{\Phi}\rangle = \begin{pmatrix} 0 \\ 0 \\ -w^* \\ 0 \end{pmatrix}$$

p. 123, in Eq. (7.44) and p. 124 in Eq. (7.45)

$$\int d^5x\sqrt{-\det G} \qquad \text{should be} \qquad \int d^5x\sqrt{-g}$$

p. 124, below Eq. (7.45)

$$m_B^{\alpha\beta} = \tilde{\kappa}_\ell^{\alpha\beta} w\sqrt{2k} \qquad \text{should be} \qquad m_B^{\alpha\beta} = \tilde{\kappa}_\ell^{\alpha\beta} w\sqrt{k}$$

p. 139, Eq. (7.103), in the right-hand side of the second equation

$$\frac{2m_{Be}}{\sqrt{k}} \qquad \text{should be} \qquad \frac{m_{Be}}{\sqrt{k}}$$

p. 139, Eq. (7.104), in the right-hand side of the second equation

in the second equation

$$\frac{m_{Be}}{\sqrt{k}} \qquad \text{should be} \qquad \frac{m_{Be}}{2\sqrt{k}}$$

in the third equation

$$\frac{m_{Be}^2}{k^2} \qquad \text{should be} \qquad \frac{m_{Be}^2}{2\,k^2}$$

$$\frac{m_{Be} M_e}{k^{3/2}} \qquad \text{should be} \qquad \frac{m_{Be} M_e}{2\, k^{3/2}}$$

p. 140, Eq. (7.107),

$$\frac{m_{Be} \lambda}{\sqrt{k}} \qquad \text{should be} \qquad \frac{m_{Be} \lambda}{2\sqrt{k}}$$

p. 140, Eq. (7.108), the second row and third column of $K^{\pm}_{\nu_e}$

$$\frac{m_{Be}}{k} \qquad \text{should be} \qquad \frac{m_{Be}}{2\, k}$$

p. 140, Eq. (7.109), in the last term

$$\frac{m_{Be}^2}{k} \qquad \text{should be} \qquad \frac{m_{Be}^2}{2\, k}$$

p. 141, Eq. (7.110) should be

$$m_{\nu_e} \simeq \begin{cases} \dfrac{m_e^2 M_e z_L^{2c_e+1}}{(c_e + \frac{1}{2}) m_{Be}^2} & \text{for } c_e > \frac{1}{2} \ , \\[2ex] \dfrac{m_e^2 M_e}{(|c_e| - \frac{1}{2}) m_{Be}^2} & \text{for } c_e < -\frac{1}{2} \ . \end{cases}$$

p. 142, Table 7.6, the values of m_{B_α} should be

Leptons	$\cdots$	$m_{B\alpha}$ (GeV)	$\cdots$
(ν_e, e)		6.8×10^5	
(ν_μ, μ)		1.8×10^8	
(ν_τ, τ)		4.1×10^9	

Chapter 8

Wave functions given in Section 8.3 are all in the twisted gauge. Gauge and Higgs couplings in Sections 8.4 and 8.5 are evaluated in the twisted gauge.

p. 167, Eq. (8.39), in the second row and third column of the matrix $K^{\pm}_{\nu_e}$

$$m_{Be}/k \qquad \text{should be} \qquad m_{Be}/2k$$

p. 167, Eq. (8.41), wave functions $g_R^{\nu_e^{\pm(n)}}(z)$ and $h^{\nu_e^{\pm(n)}}$ should be

$$g_R^{\nu_e^{\pm(n)}}(z) = \frac{1}{\sqrt{r_{\nu_e^{\pm(n)}}}} \, i\bar{c}_H C_R(z)/C_R(1)$$
$$h^{\nu_e^{\pm(n)}} = \frac{1}{\sqrt{r_{\nu_e^{\pm(n)}}}} \, \frac{i m_{B_e}}{k\lambda_{\nu_e^{\pm(n)}} \mp M_e}$$

p. 178, Eq. (8.72), in the first line

$$\mathcal{L}^{Wud} = \frac{g_w}{\sqrt{2}} \sum_{\ell=0}^{\infty} W_\mu^{(\ell)\dagger} \qquad \text{should be} \qquad \mathcal{L}^{Wud} = -i\frac{g_w}{\sqrt{2}} \sum_{\ell=0}^{\infty} W_\mu^{(\ell)\dagger}$$

p. 179, Eq. (8.74), in the first line

$$\mathcal{L}^{W\nu_e e} = \frac{g_w}{\sqrt{2}} \sum_{\ell=0}^{\infty} W_\mu^{(\ell)\dagger} \qquad \text{should be} \qquad \mathcal{L}^{W\nu_e e} = -i\frac{g_w}{\sqrt{2}} \sum_{\ell=0}^{\infty} W_\mu^{(\ell)\dagger}$$

p. 182, Eq. (8.87), the expression for $\hat{g}_{L/R\,\ell nm}^{Zdd,su2}$ should be

$$\hat{g}_{L/R\,\ell nm}^{Zdd,su2} = \cos\theta_W^0 T_d^3 \, G_W[(h^L, h^R, \hat{h})_{Z^{(\ell)}}^{su2}; (f,g)_{L/R}^{d^{(n)}}, (f,g)_{L/R}^{d^{(m)}}]$$

p. 183, the first line, the sentence

"The Z couplings to $d^{(n)}D^{(m)}$ and $D^{(n)}D^{(m)}$ are very small, $\cdots$"

should be replaced by

"The Z couplings to $d^{(n)}D^{(m)}$ and $D^{(n)}D^{(m)}$ are very small except for diagonal elements $\hat{g}_{L/R\,\ell nn}^{ZDD}$ for which there are contributions from the $U(1)_X$ part, $\cdots$"

Bibliography

p. 260, the reference [99], the title of the paper is

"Gauge Coupling Unification in Simplified Grand Gauge-Higgs Unification".