Errata Corrige to Pierre Ramond's book - Field Theory: A Modern Primer (Second Edition - 2001)

by Umberto Natale

Page	**Equation or Line**	**Errata**	**Corrige**
50	Eqn. (2.1.36)	$\hat{p}\|q\rangle = -i\hbar\frac{\partial}{\partial q}\|q\rangle$	$\hat{p}\|q\rangle = i\hbar\frac{\partial}{\partial q}\|q\rangle$
50	Eqn. (2.1.37)	$\langle q\|\hat{p}\|Q\rangle = i\hbar\frac{\partial}{\partial q}\langle q\|Q\rangle$	$\langle q\|\hat{p}\|Q\rangle = -i\hbar\frac{\partial}{\partial q}\langle q\|Q\rangle$
50	Eqn. (2.1.38)	$\langle q\|\hat{P}\|Q\rangle = -i\hbar\frac{\partial}{\partial q}\langle q\|Q\rangle$	$\langle q\|\hat{P}\|Q\rangle = i\hbar\frac{\partial}{\partial q}\langle q\|Q\rangle$
50	Eqn. (2.1.41)	$\langle q\|Q\rangle = e^{-\frac{i}{\hbar}G(q,Q)}$	$\langle q\|Q\rangle = e^{\frac{i}{\hbar}G(q,Q)}$
65	Ln 1 after eqn. (3.1.10)	$J_i = J(\bar{x}_i)$	$J_i = J(x_i)$
65	Ln 1 after eqn. (3.1.10)	$d^4\bar{x}_1\cdots d^4\bar{x}_N$	$d^4x_1\cdots d^4x_N$
65	Ln 2 after eqn. (3.1.10)	$G^{(N)}(\bar{x}_1,\ldots,\bar{x}_N)$	$G^{(N)}(x_1,\ldots,x_N)$
67	Eqn. (3.2.15)	$\sum\frac{(-1)^N}{N!}\langle G^{(N)}(1,\ldots,N)J_1\cdots J_N\rangle_{1\ldots N}$	$\sum\frac{i^N}{N!}\langle G^{(N)}(1,\ldots,N)J_1\cdots J_N\rangle_{1\ldots N}$
69	Eqn. (3.2.19)	$\tilde{G}_0^{(2)}(p,-p) = \frac{1}{p^2-m^2+i\epsilon}$	$\tilde{G}_0^{(2)}(p,-p) = \frac{i}{p^2-m^2+i\epsilon}$
73	Ln 1 after eqn. (3.3.30)	... now local ...	... non local ...
76	Eqn. (3.4.20)	$G^{(N)}(\bar{x}_1,\ldots,\bar{x}_N) = -\frac{\delta^N Z_E}{\delta J_1\ldots\delta J_N}$	$G^{(N)}(\bar{x}_1,\ldots,\bar{x}_N) = -\frac{\delta^N Z_E}{\delta J_1\ldots\delta J_N}\Big\|_{J=0}$
77	Ln 2 after eqn. (3.4.25)	$(124),(125),(126),(135),\ldots$	$(124),(125),(126),(134),(135),\ldots$
80	Eqn. (3.4.31)	$J(\bar{x}) = (\bar{\partial}^2-m^2)\phi_{cl}(\bar{x}) - \frac{\lambda}{3!}\phi_{cl}^3(\bar{x})$	$-J(\bar{x}) = (\bar{\partial}^2-m^2)\phi_{cl}(\bar{x}) - \frac{\lambda}{3!}\phi_{cl}^3(\bar{x})$
80	Ln 2 after eqn. (3.4.38)	$\tilde{\Gamma}^{(2)}$ is minus the...	$\tilde{\Gamma}^{(2)}$ is the...
107	Ln 7 after eqn. (4.1.26)	$\tilde{\Gamma}^{(2)}(p)$ is minus the...	$\tilde{\Gamma}^{(2)}(p)$ is the...
112	Ln 9 (first figure)	$N \geq 5$	$N \geq 4$
112	Ln 15 (fourth figure)	$N > 5$	$N \geq 4$
112	Ln 15 (fifth figure)	$N > 3$	$N > 1$
113	Ln 14	... of convergence D is positive ...	... of convergence D is negative ...
113	Ln 18	... its subgraphs are positive.	... its subgraphs are negative.
117	Eqn. (4.3.11)	$1 = \frac{1}{5}\left(\frac{\partial L}{\partial L} + \frac{\partial l_\mu}{\partial l_\mu}\right)$	$1 = \frac{1}{5}\left(2\frac{\partial L^2}{\partial L^2} + \frac{\partial l_\mu}{\partial l_\mu} - 1\right)$
119	Ln 1 after eqn. (4.4.1)	... and μ^2 is an arbitrary ...	... and μ is an arbitrary ...
127	Ln 1 after eqn. (4.5.4)	(... picks up a minus sign ...)	remove the comment
130	Eqn. (4.5.16)	$\ldots + \frac{m^2}{2}\lambda^2\left[\frac{1}{\epsilon^2} + \ldots\right.$	$\ldots + \frac{m^2}{2}\hat{\lambda}^2\left[\frac{1}{\epsilon^2} + \ldots\right.$
130	Eqn. (4.5.18)	$\ldots + \frac{\hat{\lambda}^2}{4}(F_1 + 3G_1 + \ldots$	$\ldots + \frac{\hat{\lambda}^2}{2}(F_1 + 3G_1 + \ldots$
134	Ln 3	... see also Peterman...	... see also Petermann...
139	Ln 2 after (4.6.16)	It is clear from (4.6.15)	It is clear from (4.6.16)
149	Ln 3 after eqn. (4.8.3)	... a factor of $(-i)$ for each vertex and propagator...	... a factor of i for each vertex and $(-i)$ for each propagator...
256	Eqn. (8.2.57)	$\Sigma(p) = -i\frac{e^2}{16\pi^2}\left(\not{p}+4m\right) + \frac{1}{\epsilon} + \text{f. t.}$	$\Sigma(p) = -i\frac{e^2}{16\pi^2}\frac{(\not{p}+4m)}{\epsilon} + \text{f. t.}$

<u>List of Alerts</u>

- ▷ Ramond in section 2.2 ("The Feynman Path Integral") evaluates the ket at greater times, *i.e.* $T > t$. This notation is opposite to the one usually used in the Path-Integral formulation, but is formally correct because he reverses the extremes of integration of the Lagrangian. From eqn. (2.3.10) Ramond begins using standard notation where the ket is evaluated at lesser times. Therefore the equations are correct but look at the signs!
- ▷ The comment in brackets on page 127 reminds us a wrong relation because the sign is positive.
- ▷ For a more detailed discussion of the equation (4.5.5) on page 127, refer to the notes of Prof. M. Matone.
- ▷ The correction on page 256 relate to a part of the course program of Quantum Field Theory II.