I. CORRECTION OF TYPOS IN "DENSE MATTER IN COMPACT STARS – A PEDAGOGICAL INTRODUCTION"


• p28, eq. (3.4): ..., and the interaction Lagrangian with Yukawa interactions between the nucleons and the mesons is

\[ \mathcal{L}_I = g_0 \bar{\psi}\sigma\psi - g_\omega \bar{\psi}\gamma^\mu\omega_\mu\psi. \]  

[the sign in front of \( g_\omega \) was a plus]

• p30, eq. (3.13) should read

\[ Z = e^{\frac{V}{T} \left( -\frac{1}{2} m_\sigma^2 \bar{\sigma} \sigma + \frac{1}{2} m_\omega^2 \bar{\omega} \omega \right) - \frac{1}{4} \int D\psi^\dagger D\psi \exp \left[ -\sum_K \psi^\dagger(K) \gamma^0 \frac{G^{-1}(K)}{T} \psi(K) \right]}. \]  

[The \( \gamma^0 \) was missing; this has no consequence for the following since it gives no contribution to the determinant in eq. (3.15), \( \det \gamma^0 = 1 \).]

• p34, Fig. 3.2 and p37, Fig. 3.3: The label of the vertical axes of both figures should read \( \epsilon/n_B - m_N \) [MeV] [The unit MeV was missing.]

• p36, eq. (3.40): On the other hand, from the definition (3.38) we obtain

\[ K = k_F^2 \left[ \frac{\partial^2 (\epsilon/n_B)}{\partial n_B^2} + \frac{\partial (\epsilon/n_B)}{\partial n_B} \frac{\partial^2 n_B}{\partial k_F^2} \right] = 9n_B \frac{\partial^2 \epsilon}{\partial n_B^2} + 12 \left( \frac{\epsilon}{n_B} - \frac{\partial \epsilon}{\partial n_B} \right), \]  

where \( \partial n_B / \partial k_F = 3n_B/k_F \) (see Eq. (3.28a)) has been used.

[the second term after the first equal sign was missing; as a consequence, the 12 in the final result was an 18; for the following argument, this difference is irrelevant]

• p41, below eq. (3.55): The purely gluonic contribution to the Lagrangian is given by

\[ \mathcal{L}_{\text{gluons}} = -\frac{1}{4} G^a_{\mu\nu} G^a_{\mu\nu}, \]  

where \( G^a_{\mu\nu} = \partial_\mu A^a_\nu - \partial_\nu A^a_\mu + g f^{abc} A^b_\mu A^c_\nu \) with the \( SU(3)_c \) structure constants \( f^{abc} \) is the gluon field strength tensor.

["\( f^{abc} \) after “structure constants” was missing]

• p118, eq. (A.5):

\[ Z = \text{Tr} e^{-\beta(\mathcal{H} - \mu N)} = \int D\pi D\pi^* \int_{\text{periodic}} D\varphi D\varphi^* \exp \left[ -\int X (\mathcal{H} - \mu N - i(\pi \partial_\tau \varphi + \varphi^* \partial_\tau \varphi^*) \right], \]  

[this partition function was written for a real scalar field, but since we discuss a complex field it should include \( \pi^* \) and \( \varphi^* \); all following related equations correctly contain real and imaginary parts]

• p119, eq. (A.11):

\[
\mathcal{H} = \mu N = \pi_1 \partial_0 \varphi_1 + \pi_2 \partial_0 \varphi_2 - \mathcal{L}_0 - \mu N
\]

\[
= \frac{1}{2} \left[ \pi_1^2 + \pi_2^2 + (\nabla \varphi_1)^2 + (\nabla \varphi_2)^2 + m^2 (\varphi_1^2 + \varphi_2^2) + \frac{\lambda}{2} (\varphi_1^4 + \varphi_2^4) \right] - \mu (\varphi_2 \pi_1 - \varphi_1 \pi_2). 
\]  

[the term \( \propto \lambda \) in the second line was missing]
p126, eq. (A58) should read

$$\int_X \bar{\psi} (\gamma^0 \partial_x - i \gamma \cdot \nabla + \gamma^0 \mu - m) \psi = - \sum_K \psi^\dagger(K) \gamma^0 \frac{G_0^{-1}(K)}{T} \psi(K)$$

(7)

[The $\gamma^0$ was missing; see above comment to p30, eq. (3.13).]