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Erratum

Mass splitting of the pseudoscalar and vector mesons induced by the homogeneous vacuum gluon field

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The correct form of the quark propagator (3.6) reads:

$$\tilde{H}_f(p \mid B) = \frac{1}{2v\Lambda}\int_0^1 \mathrm{d}t \mathrm{e}^{-\frac{p^2}{2v\Lambda^2}t}\left(\frac{1-t}{1+t}\right)^{\frac{\alpha_f^2}{4v}} \times\left[\alpha_f + \frac{1}{\Lambda}p_\mu\gamma_\mu + it\frac{1}{\Lambda}(\gamma f p)\right] \times\left[P_\pm + P_\mp\frac{1+t^2}{1-t^2} - \frac{i}{2}(\gamma f\gamma)\frac{t}{1-t^2}\right] .$$

In accordance with the above change the correct expression for polarization function $\tilde{\Pi}_J$ in Appendix has the form:

$$\begin{aligned}&\tilde{\Pi}_J(-M^2; m_f, m_{f'}; \Lambda = \\ &-\frac{\Lambda^2}{4\pi^2}\mathrm{Tr}_v\int_0^1 dt_1\int_0^1 dt_2\int_0^1 ds_1\int_0^1 ds_2 \\ &\times\left(\frac{1-s_1}{1+s^1}\right)^{\frac{m_f^2}{4v\Lambda^2}}\left(\frac{1-s_2}{1+s_2}\right)^{\frac{m_{f'}^2}{4v\Lambda^2}} \\ &\times\left[\frac{M^2}{\Lambda^2}\frac{F_1^{(J)}(t_1,t_2,s_1,s_2)}{\Phi_1^4(t_1,t_2,s_1,s_2)}\right. \\ &+\frac{m_f m_{f'}}{\Lambda^2}\frac{F_2^{(J)}(s_1,s_2)}{(1-s_1^2)(1-s_2^2)\Phi_2^2(t_1,t_2,s_1,s_2)} \\ &\left.+\frac{2v(1-4v^2t_1t_2)F_3^{(J)}(s_1,s_2)}{\Phi_2^3(t_1,t_2,s_1,s_2)}\right] \\ &\times\exp\left\{\frac{M^2}{2v\Lambda^2}\Phi(t_1,t_2,s_1,s_2)\right\} ,\end{aligned}$$

where

Table 1. Parameters of the model

m_u (MeV)	m_d (MeV)	m_s (MeV)	Λ (MeV)	$\alpha_s = g^2/4\pi$
198.3	198.3	413	319.5	7.9

Table 2. The masses (MeV) and meson-quark coupling constants h of the light mesons

Meson	π	ρ	K	K^*	η	η'	ω	ϕ
M	140	770	496	890	437	939	770	1034
$M^{\exp}$	140	770	496	890	550	960	786	1020
h	6.51	4.16	7.25	4.48	6.58	6.27	4.16	4.94

$$\begin{aligned}&\Phi = \frac{\Phi_1(t_1,t_2,s_1,s_2)}{\Phi_2(t_1,t_2,s_1,s_2)} ,\\ &\Phi_1 = 2v(t_1+t_2)[s_1\xi_f^2 + s_2\xi_{f'}^2] \\ &\qquad +s_1s_2[1+4v^2t_1t_2(\xi_f-\xi_{f'})^2] ,\\ &\Phi_2 = 2v(t_1+t_2)(1+s_1s_2) + (1+4v^2t_1t_2)(s_1+s_2) ,\\ &F_1^{(P)} = (1+s_1s_2)[A_1A_2 + 4v^2(t_1-t_2)^2\xi_f\xi_{f'}s_1s_2] ,\\ &F_1^{(V)} = \frac{1}{3}[(3-s_1s_2)A_1A_2 + 4v^2(t_1-t_2)^2\xi_f\xi_{f'} \\ &\qquad \times s_1s_2(1-3s_1s_2)] ,\\ &A_1 = [1-4v^2t_1t_2(\xi_f-\xi_{f'})]s_1 + 2v(t_1+t_2)\xi_{f'} ,\\ &A_2 = [1+4v^2t_1t_2(\xi_f-\xi_{f'})]s_2 + 2v(t_1+t_2)\xi_f ,\\ &F_2^{(P)} = (1+s_1s_2)^2 , \quad F_2^{(V)} = 1-s_1^2s_2^2 ,\\ &F_3^{(P)} = 2(1+s_1s_2) , \quad F_3^{(V)} = 1-s_1s_2 .\end{aligned}$$

As a result the fitted parameters and meson masses take the values given in Tables 1, 2 ($\cos^2\alpha = 1/5$, $\theta = -23^\circ$, $m_c = 1650\,\mathrm{MeV}$). Thus the changes are reduced to a reparametrization of the model.