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Erratum

Erratum to: "QCD-based pion distribution amplitudes confronting experimental data" [Phys. Lett. B 508 (2001) 279] ☆

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We used a wrong formula, Eq. (B.1), for the radiative corrections to the spectral density of the axial–axial correlator. The correct one should read as follows ($\bar{x} \equiv 1 - x$):

$$\rho^{\text{pert}}(x, s) = 3x\bar{x}\left[1 + a_s C_F\left(5 - \frac{\pi^2}{3} + \ln^2(\bar{x}/x)\right)\right]\frac{1}{2\pi^2}. \tag{1}$$

We reanalyzed our sum rules using the correct expression and obtained new parameters for the phenomenological spectral density in the axial channel:

$$\rho^{\text{phys}}(s) = f_\pi^2 \delta(s) + f_{A_1}^2 \delta\left(s - m_{A_1}^2\right), \tag{2}$$

where A_1 in fact represents a mixture of the real A_1 and π' mesons. The optimum stability of the analyzed sum rules is achieved for $s_0 = 2.25\ \text{GeV}^2$ and $m_{A_1}^2 = 1.616\ \text{GeV}^2$. The error induces mainly a shift in the determination of the decay constants of the pion and its excitations; it does practically not influence the values of the extracted moments of the pion distribution amplitude, as one can see from Table 1, where we collect the values of these quantities in comparison with the published ones.

Table 2 represents the changes for the effective A_1-meson decay constants and moments.

Table 1
The moments $\langle \xi^N \rangle_\pi(\mu^2)$ determined at $\mu^2 \sim 1.35\ \text{GeV}^2$ with associated errors put in parentheses. The old values are given in the first row and the new ones in the second row

f_π (GeV)	$N = 2$	$N = 4$	$N = 6$	$N = 8$	$N = 10$	$\langle x^{-1} \rangle$
0.131(8)	0.265(20)	0.115(12)	0.061(8)	0.037(5)	0.024(4)	$3.35(32)^{\text{SR}}$
0.137(8)	0.266(20)	0.115(11)	0.060(7)	0.036(5)	0.025(4)	$3.35(30)^{\text{SR}}$

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Table 2
The moments $\langle \xi^N \rangle_{A_1}(\mu^2)$ determined at $\mu^2 \sim 1.35\ \mathrm{GeV}^2$

f_{A_1} (GeV)	$N = 2$	$N = 4$	$N = 6$	$N = 8$	$N = 10$	$\langle x^{-1} \rangle$
0.210(17)	0.21(2)	0.116(12)	0.078(8)	0.055(6)	0.042(5)	$3.6(4)^{\mathrm{SR}}$
0.221(20)	0.21(2)	0.113(12)	0.076(8)	0.055(6)	0.040(5)	$3.5(4)^{\mathrm{SR}}$

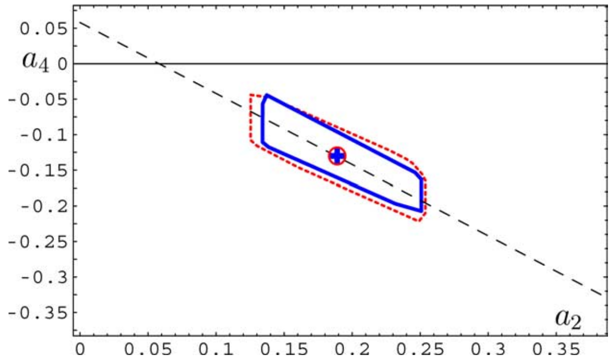

Fig. 1. Corrected (a_2, a_4) area (solid line) in comparison with the published one (dotted line). The cross marks the new position of the BMS distribution amplitude, while the circle denotes the old one.

The old and new parameter regions of (a_2, a_4) pairs, corresponding to the allowed values of the second and fourth Gegenbauer coefficients, calculated with the corrected sum rules in comparison with the published ones for the value $\lambda_q^2 = 0.4\ \mathrm{GeV}^2$ at $\mu^2 \sim 1.35\ \mathrm{GeV}^2$ are given in Fig. 1.

Given that the two (a_2, a_4) areas almost coincide and the BMS distribution amplitude is only infinitesimally shifted, none of the results of our analyses, published in [1–3], is affected.

References

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