Erratum: Complete Spin Structure of the Pion–Nucleon-Loop Delta Self-Energy

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Abstract. A calculational error is corrected, numerical results are affected very little.

In Ref. [1] a sign error in an intermediate result led to erroneous expressions for some of the terms $\alpha_i(p^2)$ in expression (9). The corrected (including also typographical errors) expressions are the following:

$$\begin{aligned}
 \alpha_1 &= -\frac{Mk_*^2}{3}, \\
 \alpha_2 &= -\frac{k_*^2}{6p^2}(p^2 + M^2 - m^2), \\
 \alpha_5 &= -\frac{aM}{3}(2k_*^2 - 3am^2), \\
 \alpha_6 &= -\frac{2}{3}ak_*^2 - \frac{a^2}{2p^2}[p_*^4 - m^2(3p^2 - M^2 + m^2)], \\
 \alpha_9 &= \frac{1}{6p^2}[k_*^2p_*^2 + a(p_*^4 + 2m^2p^2 - 3m^2p_*^2)], \\
 \alpha_{10} &= \frac{1}{6p^2}\{k_*^2p_*^2 + 3a(1 + 2a)[p_*^4 - 2m^2p^2 - m^2p_*^2]\}. \quad (9)
 \end{aligned}$$

There were also typographical overall sign errors on the right-hand sides of expressions (3), (5) and (7).

Numerical results are affected very little by the corrections. The coupling and the cut-off are slightly larger than quoted in [1], for example an excellent fit to spin-3/2 isospin-3/2 pion–nucleon phase shift has been achieved with $g = 19$, $\Lambda = 0.97$ GeV, $M_\Delta = 1.279$ GeV, $a = -0.5$. A somewhat larger coupling

($g = 20$) and smaller cut-off ($\Lambda = 0.92$ GeV) also gives an excellent fit (with $M_\Delta = 1.273$ GeV). The off-shell parameter a can take values between -1 and 0 without affecting significantly the phase shift.

References

1. C.L. Korpa, *Heavy Ion Phys.* 5 (1997) 77.