Errata

Erratum: Massless electrodynamics on the 5-dimensional unit hypersphere: An amplitude-integral formulation [Phys. Rev. D 8, 2400 (1973)]

Stephen L. Adler

F. R. Ore, Jr. has pointed out to me that the derivation of the effective propagator in the Appendix contains some errors. Equation (A7) should read

$$\frac{d}{dz}[(1-z^2)\Phi_3''(z)-4z\Phi_3'(z)]=\frac{4-3z}{(1-z)^2}\,,$$

which gives for the solution in Eq. (A8) the result

$$\Phi_3'(z)=-\frac{1}{2}\frac{1}{1-z}+\frac{1}{2}\frac{1}{1+z}+\left[\frac{1}{(1+z)^2}+\frac{1}{1+z}\right]\ln[\tfrac{1}{2}(1-z)]\,.$$

These corrections do not affect any of the results obtained in the body of the paper, where the explicit form of the effective propagator was not needed.

Erratum: Massless electrodynamics in the one-photon-mode approximation [Phys. Rev. D 10, 2399 (1974)]

Stephen L. Adler

In Sec. VI B of this paper, numerical evidence was given suggesting that the zeros of $\Delta_{\xi j}(\lambda)$ obey the condition $|\mathrm{Im}\,\lambda|/|\mathrm{Re}\,\lambda|>1$, which would imply cut-plane analyticity for the radiative-corrected vacuum amplitude W_1. Recently, Chernin and Wu[1] have shown that this conjecture is false by deriving the following approximate large-ξ expression for the zeros ξ_n of $\Delta_{\xi\,1/2}(\lambda)$:

$$2[F(\theta_0)+n\pi i]-\tfrac{1}{2}\ln\left(-\frac{2\lambda}{\pi}\right)-\tfrac{3}{2}\ln\cos\theta_0=0\,, \tag{1}$$

$$\theta_0=\sin^{-1}\left(\frac{\xi}{-\lambda}\right)^{1/2},\quad F(\theta)=\xi\ln\tan\tfrac{1}{2}\theta-\lambda\cos\theta\,.$$

For $\xi=\frac{15}{2}$ this formula gives the following predicted zeros:

$$\begin{aligned} &n=2:\ \lambda=-11.63+i\,9.58\,,\\ &n=3:\ \lambda=-12.52+i\,13.14\,,\\ &n=4:\ \lambda=-13.23+i\,16.57\,. \end{aligned} \tag{2}$$

The $n=4$ zero is the one given in Table II of Sec. VI B; a reexamination of the computer output which I used in preparing Table II indicates that the lower zeros were missed by careless reading of the output (the programming itself was correct), and are indeed given quite accurately by the Chernin-Wu formula. For example, the program used to get Table II gives $\lambda=-11.66+i\,9.56$ for the location of the $n=2$ zero for $j=\frac{1}{2}$, $\xi=\frac{15}{2}$. For fixed n, the Chernin-Wu formula shows that $-\lambda/\xi\to 1$ as $\xi\to\infty$, and so in fact there are zeros with arbitrarily small $|\mathrm{Im}\,\lambda|/|\mathrm{Re}\,\lambda|$, and hence no zero-free angular sectors for the Fredholm determinant, which is proportional to

$$\prod_{j,\,\xi}[\Delta_{\xi j}(\lambda)\Delta_{\xi j}(-\lambda)]^{2j+1}\,.$$

The zeros "near" the real axis still lie outside the zero-free strip containing the real axis which was established in Sec. IV.

[1] D. Chernin and T. T. Wu (unpublished).