Errata

Erratum: Canonical quantization of supergravity [Phys. Rev. D 29, 2199 (1984)]

P. D. D'Eath

There is a sign error in Eq. (8.11), which should read

$$\delta({}^3R_{ij}^{\rm lin}) = -\tfrac{1}{2} i\kappa\tilde{\epsilon}^{A'}(F^{{\rm lin}A}{}_{ik,j}e_{AA'k} + F^{{\rm lin}A}{}_{ki,k}e_{AA'j}) + (i \leftrightarrow j) \ . \tag{8.11}$$

As a result, the quantities I and J defined in Eqs. (8.23) and (8.25) do not obey the invariance property $\delta(I+\frac{1}{2}i\kappa^2 J)=0$ under a rigid left-handed supersymmetry transformation parametrized by $\tilde{\epsilon}^{A'}=\text{const}$ at the final surface.

Instead, it can be shown that there is no fermionic partner J_1 for I such that $\delta(I+J_1)=0$. Define the linearized electric and magnetic parts of the Weyl tensor:

$$E_{ij} = {}^3R_{ij}^{\rm lin}, \quad B_{ij} = \epsilon_{ikl}K_{jk,l}^{\rm lin} \ .$$

The corrected Eq. (8.24) should read

$$\delta I = \kappa \int d^3x\, \epsilon_{kil}e_{AA'l}\tilde{\epsilon}^{A'}F^{{\rm lin}A}{}_{kj}(E_{ij}+iB_{ij}) \ . \tag{8.24}$$

The variations of the linearized spatial spin-$\frac{3}{2}$ field strengths are

$$\delta F^{{\rm lin}A}{}_{ij} = 0 \ ,$$

$$\delta\tilde{F}^{{\rm lin}A'}{}_{ij} = [-2i\kappa^{-1}\epsilon_{jkl}n_A{}^{A'}e^{AB'}{}_l(E_{ki}-iB_{ki})\tilde{\epsilon}_{B'}] - (i \leftrightarrow j) \ .$$

By the global chiral invariance of the theory, any fermionic partner J_1 for I must involve one power of $\psi^{{\rm lin}A}{}_i$ and one power of $\tilde{\psi}^{{\rm lin}A'}{}_i$. If $I+J_1$ is the quadratic-order part of a counterterm invariant under a local transformation parametrized by $\tilde{\epsilon}^{A'}(x)$ at the final surface, then the local transformation law

$$\delta\tilde{\psi}^{A'}{}_i = 2\kappa^{-1}\partial_i\tilde{\epsilon}^{A'} + \cdots$$

shows that $\tilde{\psi}^{{\rm lin}A'}{}_i$ can only appear in J_1 through the field strength $\tilde{F}^{{\rm lin}A'}{}_{ij}$. Hence, under a rigid transformation, δJ_1 can only involve E_{ij} and B_{ij} through the combination $(E_{ij}-iB_{ij})$. Thus, one cannot form an invariant starting with $I+J_1$. Combined with the discussion in the penultimate paragraph of Sec. VIII, this shows that there are no purely surface counterterms for supergravity at one loop in the presence of boundaries: Only the usual Euler invariant term is permitted. Thus the one-loop finiteness properties of $N=1$ supergravity are the same, whether or not boundaries are present.

Erratum: Gauge invariance and the finite-element solution of the Schwinger model [Phys. Rev. D 31, 383 (1985)]

Carl M. Bender, Kimball A. Milton, and David H. Sharp

In printing, some lines of text were omitted.

1. The first sentence of the last paragraph of Sec. I should read: "The ultimate objective of this program is to solve non-Abelian operator field equations on a Minkowski lattice by using the method of finite elements."
2. Reference 4 should read: "It is the nonlocality of the Minkowski lattice Hamiltonian which allows this finite-element formulation to evade the no-go theorems [L. H. Karsten and J. Smit, Nucl. Phys. **B183**, 103 (1981); H. B. Nielsen and M. Ninomiya, *ibid.* **B185**, 20 (1981); J. M. Rabin, Phys. Rev. D **24**, 3218 (1981)], which require fermion doubling in a unitary, chiral-invariant, local fermion lattice theory."

The following errors also appeared:

3. In Eq. (17), third line, the argument of the third sgn function should be $m''-m$.
4. In the last sentence of Sec. II the work "interactively" should be "iteratively."
5. On the right-hand side of (36), n should be h.
6. In Ref. 13, "observed" should be "observe."

