Errata

Erratum: Light neutral boson in spinor-connection theory [Phys. Rev. D 36, 3821 (1987)]

J. T. Lynch

It was argued that spinor-connection theory admits a very light neutral boson in the case where, with reference to Eqs. (2.7) and (2.8), the strong-potential term $-KB$ dominates over the torsion term A^2 in the vicinity of the Schwarzschild radius at $y=\eta$. With the torsion term put to zero, it was tacitly assumed that the solution given by Eqs. (2.31)–(2.36) would hold good right down into the center as $y \to 0$. This is not true. In fact, if the torsion is *exactly zero,* the true solution blows up badly at the center, with $f \to \infty$.

To avoid this disastrous outcome, it is necessary to admit a suitably small torsion by replacing Eqs. (2.13)–(2.15) with $S=\lambda P, R=\lambda Q$, with $\lambda = 1-\epsilon$, $0<\epsilon \ll 1$, so that $A \approx \epsilon B$. It can now be shown that the strong-potential term will dominate over the torsion term provided that $\epsilon < \eta/\sqrt{3}$. The correct solution as $y \to 0$ is given by

$$\frac{yg}{f} \approx \frac{\eta}{t_0^2}, \quad f = \text{const} \times y^{1+\theta}, \quad \theta > \tfrac{1}{2}, \quad t_0 > 2, \quad P \approx \sqrt{b_0}\cos(\sigma \ln y + \phi_1) ,$$

$$Q \approx \sqrt{b_0}\sin(\sigma \ln y + \phi_1), \quad R \approx \lambda\sqrt{b_0}\cos(\sigma \ln y + \phi_2), \quad S \approx \lambda\sqrt{b_0}\sin(\sigma \ln y + \phi_2) ,$$

where σ, ϕ_1, and ϕ_2 are constants. The functions K and J are given as before by Eqs. (2.35) and (2.36).

Fortunately, the previous equation (2.39) still holds true, so that the upper limit for the mass μ is still set by $\mu < 0.25$. Numerical integration of the field equations has now been carried out, confirming the above properties of the solution and giving the result that $\mu \approx 0.07$.

