Erratum

Erratum: Search for right-handed currents in muon decay [Phys. Rev. D 34, 1967 (1986)]

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The correction to our result for $\xi P_\mu \delta/\rho$ due to muon depolarization in scattering with unpolarized electrons was computed incorrectly. This mistake was caused by an error[1] in a calculation published by Ford and Mullin.[2] Their Eq. (21) for the laboratory muon fractional kinetic-energy loss w should read

$$w = 4\frac{m_e}{m_\mu}\sin^2\frac{\theta}{2} , \quad (1)$$

rather than

$$w = \beta^2\frac{m_e}{m_\mu}\sin^2\frac{\theta}{2} . \quad (2)$$

Here θ is the center-of-momentum scattering angle and βc is the laboratory muon velocity. Equation (1) is larger than Eq. (2) by a factor of $4/\beta^2$, where $\beta < 0.27$. Since the correction we applied (7.3×10^{-4}) is inversely proportional to w, the true correction is more than 50 times smaller and therefore is negligible. Correspondingly, slight modifications to our quantitative results are required.

The corrected combined result from all stopping targets is

$$\xi P_\mu \delta/\rho = 0.997\,90 \pm 0.000\,46(\text{stat}) \pm 0.000\,75(\text{syst}) .$$

Although this central value is not as close to the $V-A$ prediction of unity as before (2.4 vs 1.6 standard deviations), the various possible upward corrections to $\xi P_\mu \delta/\rho$ discussed in Secs. V C, VI A, and VI B would tend to bring it closer to the predicted value. With the unphysical region $(\xi P_\mu \delta/\rho > 1)$ excluded, the 90% confidence limit becomes

$$\xi P_\mu \delta/\rho > 0.996\,77 .$$

Since our central value for $\xi P_\mu \delta/\rho$ obtained by means of the muon-spin-rotation technique[3] was also affected by the same error, the combined 90% confidence limit from

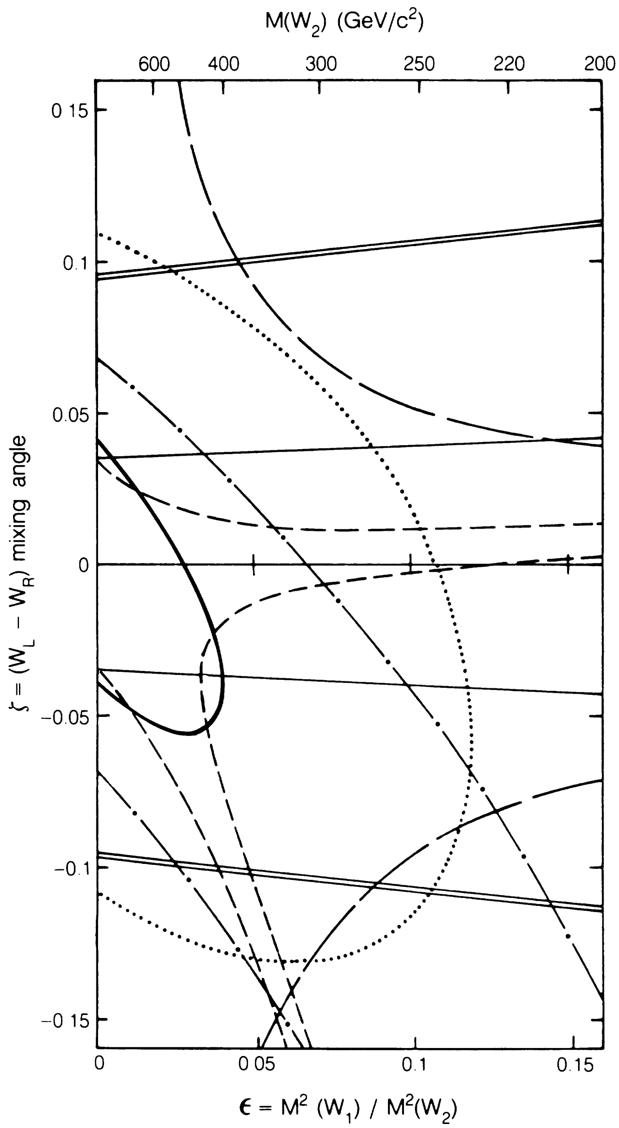

FIG. 1. Experimental 90% confidence limits on the mass-squared ratio ϵ and mixing angle ζ for the gauge bosons W_1 and W_2.

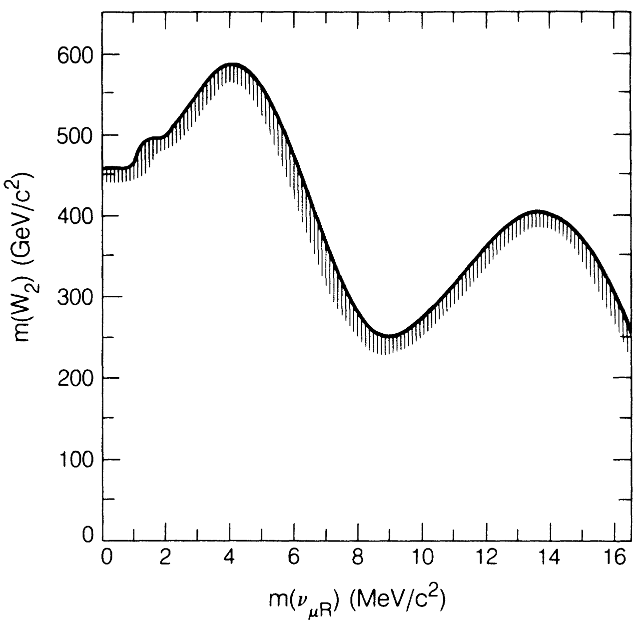

FIG. 11. Approximate 90% confidence limits on $m(W_2)$ vs $m(\nu_{\mu R})$ assuming $m(\nu_{eR})<1$ MeV/c^2, and no mixing for W_1 and W_2 or for neutrinos.

this experiment and Ref. 3 becomes

$$\xi P_\mu \delta/\rho > 0.996\,82 \ . \tag{3}$$

All limits on the W_1-W_2 mixing angle ζ and on the W_2 mass that are quoted in Sec. VII may be recomputed using Eq. (3). These limits are proportional, respectively, to the second or inverse fourth root of $(1-\xi P_\mu \delta/\rho)$; and they change, respectively, by $+13.5\%$ or -6.5%. Assuming $m(W_1)=81$ GeV/c^2, 90% confidence limits for the following special cases are obtained: $m(W_2)>482$ GeV/c^2 for $\zeta=0$ and $m(W_2)>406$ GeV/c^2 when ζ is unconstrained; $|\zeta|<0.040$ for $m(W_2)=\infty$ and $-0.056<\zeta<0.040$ when $m(W_2)$ is unconstrained. Limits on familons (Sec. VII F) remain unchanged.

Figure 1 displays a corrected contour corresponding to the more general 90% confidence limits on $M(W_2)$ and ζ from this experiment, together with limits from other experiments on μ decay, β decay, and $\nu N,\bar{\nu}N$ scattering. The sources of these other limits are described in Sec. I. Figure 11 exhibits the corrected limits on $m(W_2)$ vs $m(\nu_{\mu R})$. The computation of these limits is described in Appendix F.

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[1]We wish to thank Professor H-J. Gerber, Professor W. Fetscher, and Professor F. Scheck for pointing out the error in Ref. 2.

[2]G. W. Ford and C. J. Mullin, Phys. Rev. **108**, 477 (1957).

[3]D. P. Stoker *et al.*, Phys. Rev. Lett. **54**, 1887 (1985); D. P. Stoker, Ph.D. thesis, University of California, Berkeley (Lawrence Berkeley Laboratory Report No. LBL-20324).