where m_μ is the mass of the mu meson and m_0 is the mass of the electron. Numerically the term δ_2 is seen to be of the same order of magnitude as the usual fourth-order correction.

This note was stimulated by recent advances in experimental techniques for the measurement of the magnetic moment of the mu meson. It does not seem inconceivable that it will be possible to measure both the mass and the magnetic moment of the mu meson with an accuracy sufficient to test these radiative corrections. The experimental accuracy will almost certainly be sufficient to test the correction of order α.

In this connection we wish to draw attention to a note by Berestetskii, Krokhin, and Khlebnikov[3] concerning the effect on the magnetic moment of the mu meson of a modification of quantum electrodynamics at small distances.

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Magnetic Moment of the μ Meson

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IN the very recent past, the experimental g value—and thus the magnetic moment—of the μ^+ meson was still so uncertain that it did not allow one even to decide whether its spin was $\frac{1}{2}$ or $\frac{3}{2}$. Now, new and powerful methods, due to Garwin, Lederman, and Weinrich,[1] have already determined it to be $+2.00 \pm 0.1$. Moreover these authors have designed a magnetic resonance experiment to determine the magnetic moment to $\sim 0.03\%$. This is only one order of magnitude bigger than the α^2 corrections to this moment, and it seems to be worthwhile, owing to these rapid improvements of the experimental situation, to look into the predictions of quantum electrodynamics.

For the μ meson, with spin $\frac{1}{2}$, the results of Schwinger[2] and Karplus and Kroll[3] can be applied, but one has to consider, in the fourth-order corrections, one more term, the contribution of which is not negligible. It is due to the vacuum polarization effect by electrons during the virtual photon propagation. Its contribution to the magnetic moment is given, in units of $e\hbar(2Mc)^{-1}$, by the integral

$$\mu_P = \frac{\alpha^2}{\pi^2}\int_0^1 du \int_0^1 dv \frac{u^2(1-u)v^2(1-v^2/3)}{u^2(1-v^2)+\lambda(1-u)},$$

with $\lambda = 4m^2/M^2$, m and M being the electron and the μ-meson masses, respectively.

This yields

$$\mu_P = \frac{\alpha^2}{\pi^2}\left[\tfrac{1}{6}\ln(1/\lambda) + \tfrac{1}{3}\ln 2 - \frac{25}{36} + \epsilon\right],$$

the error ϵ being shown to be less than $O(\lambda^{\frac{1}{2}})$. With $M = 207.2m$, the numerical value is

$$\mu_P = (\alpha^2/\pi^2)(1.08),$$

and together with the results of the previous authors, the magnetic moment of the μ meson amounts to

$$\mu = \left[1 + \frac{\alpha}{2\pi} - \left(\frac{\alpha^2}{\pi^2}\right)1.89\right](e\hbar/2Mc).$$

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K^+ Production in p-p Collisions at 3.0 Bev*

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FOR some time K^+ particle beams emanating from heavy nuclei have been observed at the Cosmotron and Bevatron,[1–5] first by emulsion and then by counter techniques. The direct observation of strange particle production by π^- mesons of kinetic energy ~ 1.4 Bev incident on hydrogen has been studied by the Brookhaven hydrogen diffusion cloud chamber group[6] and by other groups,[7] and it has been found that, of the total $\pi^- + p$ inelastic cross section of ~ 25 millibarns, about 1 millibarn corresponds to strange particle production of the type

$$\pi^- + p \rightarrow \text{hyperon} + K \text{ meson}.$$

The observation[3–5] of K^+ mesons produced in heavy nuclei at various angles (60–90°) and lab momenta (300–500 Mev/c) gave relative cross sections, expressed in terms of the K^+/π^+ ratio at the target, of $\sim 1/20$ to 1/100.

Using the known order of magnitude cross sections for production of high-energy pions and the previously stated cross section of ~ 1 millibarn for the $\pi^- + p$ interaction leading to strange particle production, one