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### **The First CERN Muon g-2 Experiment<sup>1</sup>**

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The Summary of the 16 June 1965 publication of this experiment in *Il Nuovo Cimento* reads, “The anomalous part of the gyromagnetic ratio,  $\mathbf{a} \equiv 1/2 (g-2)$  of the muon has been measured by determining the precession  $\theta = \mathbf{a}\omega_0 B^{-1}t$  for 100 MeV/c muons as a function of storage time  $t$  in a known static magnetic field of the form  $B = B_0(1+ay+by^2+cy^3+dy^4)$ . The result is  $\mathbf{a}_{exp} = (1162 \pm 5) \cdot 10^{-6}$  compared with the theoretical value  $\mathbf{a}_{th} = \alpha/2\pi + 0.76\alpha^2/\pi^2 = 1165 \cdot 10^{-6}$ . This agreement shows that the muon obeys standard quantum electrodynamics down to distances  $\sim 0.1$  fermi. Details are given of the methods used to store muons for  $\sim 10^3$  turns in the field, and of measuring techniques and precautions necessary to achieve the final accuracy. Some of the methods of orbit analysis, magnet construction shimming and measurement, polarization analysis, and digital timing electronics may be of more general interest.” The paper is available in full at <http://www.fas.org/rlg/060065%20Nuovo%20Cimento.pdf> The authors valued highly the presentation of experimental details, which will be the emphasis of this talk, recounting the motivation of choices made with the tools and technology of that era.

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