$$\delta\omega_z = \omega_z \left[\frac{1}{m\omega_z}\frac{B_2}{B_o} - \frac{1}{2mc^2}\right] E_c.$$

and in principal the line broadening could be eliminated. Since the signal strength also follows this relation, the signal would then disappear as well , and a compromise was found in a magnetic bottle of approximately 10 G/cm^2 for a signal width of $\delta\omega_z = 0.13$ Hz [22]. Using a "trigger technique" a "micro-synchro-cyclotron" has been generated, allowing a measurement of the energy splitting of the lowest cyclotron levels (ω_{co}). Inducing spin flips will shift this frequency to higher values, which can be used to determine the anomaly. Preliminary results indicate a possible precision 5 times better than previously obtained. This may be the most accurate determination of the anomalous magnetic moment to date and for the future, but then there may be no reason why a new technique should not develop, superceeding all previous methods and pushing us ahead even further .

4.2. Other "Success Stories" of the Field.

The anomalous magnetic moment of the electron is only one amongst many success stories in the area of precision measurements using traps, and was used here by me to illustrate the force of the development made possible through the basic ingredients of infinite confinement times and perfect isolation, with a little experimental ingenuity and persistence added as spices. But there are many other measurements which followed a similar pattern:

The electron-proton mass ratio, which has first been determined in a direct measurement by the Mainz group [23,24], and with the currently best value published by R. van Dyck, Jr. from the University of Washington [25] plays an important role in determining a self consistent set of fundamental constants [26]. The electron-positron magnetic moment and mass ratios [27] provide the most accurate demonstration of charged particle-antiparticle symmetry (CPT) today. A new experiment comparing the inertial masses (or to be exact the charge-to-mass ratios) of protons and antiprotons extend these CPT tests to the baryonic sector at a precision unrivaled by previous experiments [28]. The use of ion traps, both of the Penning type and the RF quadrupole type, for the realization of frequency standards with higher and higher accuracy and short and long term stability has been the back bone of the work by the group around D. Wineland at NIST [29]. Recent measurements of atomic masses aiming towards a new, atomic, mass standard to replace the antiquated standard