counts. A one-shot sweep circuit was used to measure dead time[1] and gave a visual picture of the pulse. In addition, the pulses were examined on an oscilloscope for multiplicity.

Of the four quenching gases ethylene consistently gave the best results. It was found that with a partial pressure of 0.8 to 5 cm of ethylene a plateau was obtained with less than 0.10 percent rise per volt over a length of at least 200 volts. The plateau was definitely flatter than when the other polyatomic gases were used in the same tubes.

The ethylene not only gave long, flat plateaus over a wider range of partial pressures, but also had other decisive advantages over the other polyatomic gases. As a gas rather than a vapor (e.g., alcohol), it was much more dependable under temperature changes and easier to handle. It gave no multiple counts at all whereas occasional multiple counts were obtained on replacing the ethylene by alcohol. Ethylene did not react with counters employing Zapon as a thin window as did alcohol, amyl acetate, and ether. Finally the ethylene-filled counters were very stable with respect to counting rate and recovered rapidly even after a discharge through the counter.

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[1] H. G. Stever, Phys. Rev. 61, 38 (1942).

Erratum: Electromagnetic Properties of Nuclei in the Meson Theory

[Phys. Rev. 62, 118 (1942)]
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IN deriving Eq. (69) from Eq. (65) in our calculation of the exchange magnetic moment, a minus sign was left out by mistake. The result given by Eq. (69) should therefore be multiplied by a factor -1. After this correction this result agrees in magnitude and in sign with the result given in an earlier paper.[1] The present writer (S. T. Ma) was responsible for this mistake in our joint work.

[1] S. T. Ma, Proc. Camb. Phil. Soc. 36, 351 (1940), Eq. (25).

A Dynamic Method for the Determination of the Velocity Distribution of Thermal Atoms

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July 6, 1948

WE have investigated a new method for the determination of the velocity distribution of atoms evaporated from an oven. It differs from the methods described by Eldridge, Zartman, Estermann, and others[1] in that it can be performed rapidly and is readily adaptable to other measurements connected with atomic beams.

Atoms leaving the oven are pulsed by a single rotating sector disk and detected by a Langmuir-Taylor hot-wire detector[2] about 20 cm away. The velocity distribution of the atoms in the pulses leads to varying transit times for atoms of different velocities, and therefore to a time-dependent current in the detector circuit. This current is a measure of the number of atoms arriving per unit time, and, when it is applied to a cathode-ray oscilloscope with a linear sweep, one can "see" the rate of arrival of atoms at the hot wire. Figure 1 is a photograph of an oscilloscope trace of this curve, using a beam of indium atoms.

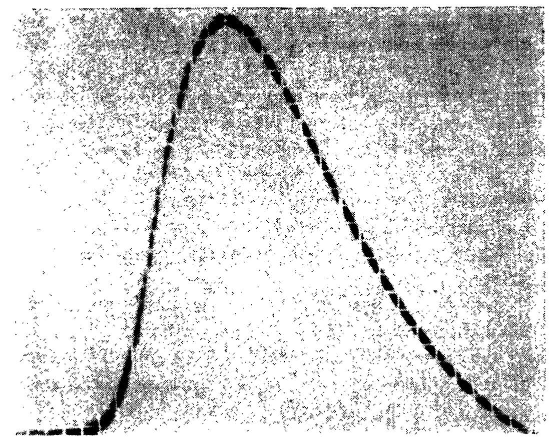

FIG. 1. Sample cathode-ray oscillogram showing the number of atoms arriving at the detector as a function of time.

Further improvements in the method may make it possible to determine the relaxation time, or the mean time an atom stays on the hot wire, if it is assumed that deviations from the atom velocities calculated from the Maxwell-Boltzmann theory are due to this effect. This will be accomplished by placing a photo-tube next to the detector and simultaneously observing the pulses produced on the oscilloscope by both the atoms and the light radiated from the oven. The time difference between the peak of the atom pulse and the peak of the light pulse may then be compared with the theoretically most probable transit time.

[1] J. A. Eldridge, Phys. Rev. 30, 931 (1927); I. F. Zartman, Phys. Rev. 37, 383 (1931); I. Estermann, O. C. Simpson, and O. Stern, Phys. Rev. 71, 238 (1947). The last-mentioned paper contains references to other researches on the subject of the velocity distribution in an atomic beam.
[2] I. Estermann, Rev. Mod. Phys. 18, 310 (1946).

On the Range of the Electrons in Meson Decay

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SOME preliminary data have been obtained in an experiment to determine the range of the electrons resulting from meson decay. The counter arrangement is shown in Fig. 1. The circuits record coincidences in trays 1 and 2, followed from between 0.6 and 4.5×10^{-6} second later by coincidences in trays 3 and 4. Presumably a meson has stopped in absorber 1, disintegrated, and traversed absorber 2. Both absorber 1 and absorber 2 are polystyrene, a hydrocarbon, except for weights of absorber 2 in excess of

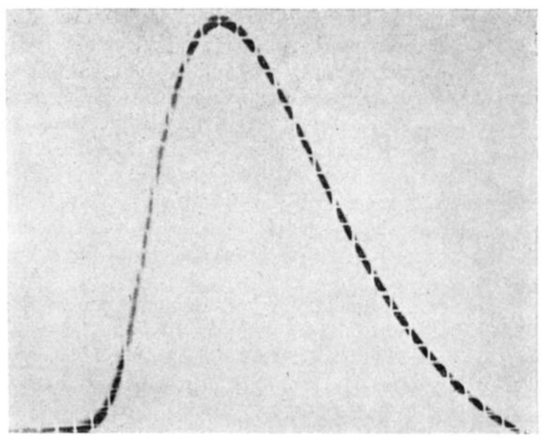

FIG. 1. Sample cathode-ray oscillogram showing the number of atoms arriving at the detector as a function of time.