excess of the quantum cross section over the SCT cross section is 0.1 percent of the whole. The numbers recorded in the table are not as accurate as the number of significant figures would suggest. The intended accuracy was about one percent but internal consistency indicates that it may be better. The second column minus the third when summed over different L contributes to the excess of $10^6 \sum \mathcal{C}_L$ over the SCT approximation the amounts -6.2, $+2.2$, -1.3, and -0.6 from the L ranges 0, 1–10, 11–50, 51—∞ respectively. The total difference is -5.9, about -1 percent of the total. At the end of the work a slight error was found in the quantum values for $L=20$, 30, 50. A crude correction replaces the -1.1, -1.1, -1.5 percent entries by roughly $+3$ percent to 1.7 percent, replacing the total quantum-classical difference by ~ 1.0, *i.e.*, ~ 0.2 percent of total. With either interpretation the difference is one percent or less of the total cross section.

* This research was supported by the Office of Ordnance Research, U. S. Army.

[1] T. Huus and Č. Zupančič, Kgl. Danske Videnskab. Selskab, Mat.-fys. Medd. **28**, No. 1 (1953).
[2] Biedenharn, Gluckstern, Hull, and Breit, Phys. Rev. (to be published).
[3] Bloch, Hull, Broyles, Bouricius, Freeman, and Breit, Phys. Rev. **80**, 553 (1950); B. E. Freeman, Dissertation, Yale University, 1950 (unpublished).

Spin, Magnetic Moment, and Hyperfine Structure of Rb^{81}*

J. P. Hobson,† J. C. Hubbs,‡ W. A. Nierenberg, and H. B. Silsbee

University of California, Berkeley, California

(Received October 11, 1954)

THE spin, hyperfine splitting, and nuclear moment of Rb^{81} (4.7 hr) have been measured. They are 3/2, 5000±125 Mc/sec, and 2.00±0.06 nuclear magnetons respectively. The zero-moment method of atomic beams was used. Figure 1 shows the zero-moment curve

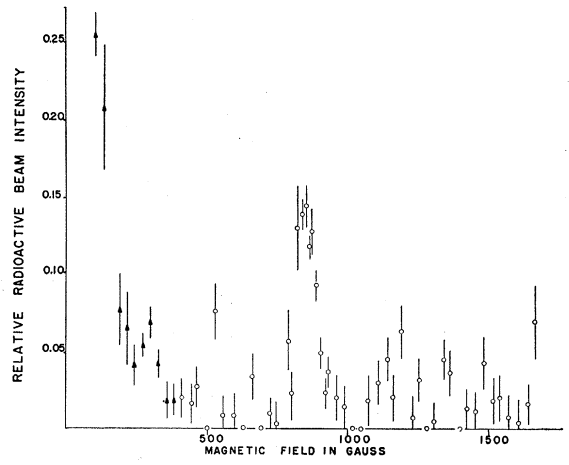

FIG. 1. Rb^{81} zero-moment curve.

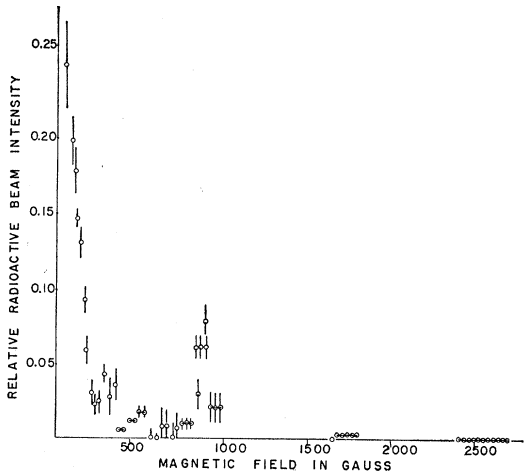

FIG. 2. Rb^{81} zero-moment pattern.

(beam intensity *vs* magnet current) for Rb^{81}. A peak appears at approximately 850 gauss. The run did not remove the possibility of spin 5/2 or 7/2. Figure 2 is another run which shows the 850-gauss peak but shows no peaks at 1700 or 2550 gauss, thus establishing the spin as 3/2. Calibration of the fields with natural Rb established the hyperfine splitting, and the ratio of radio-rubidium to natural rubidium hyperfine splittings determined the magnetic moment.

The detection was accomplished by collection of the neutral beam on sulfur buttons and counting the K x-rays. The sulfur surface collection was one of many methods tried and it apparently gave nearly full efficiency. The K x-rays were absorbed in a 1 mm×½ in. ×½ in. NaI(Tl) crystal which gave nearly 50 percent efficiency with a minimum counting background.

The isotope was produced by α bombardment and therefore had carrier added to optimize the beam. It was identified by the chemistry, its decay curve, and the behavior of the sample as a function of α energy.

There is a suggestion of a peak at 290 gauss in Fig. 1, possibly due to Rb^{82}. Further runs are being made to improve the statistics in this region and at multiples of this field.

* This research has been supported by the U. S. Office of Naval Research.
† Now at the National Research Council of Canada, Ottawa, Canada.
‡ Now at Columbia University, New York, New York.

$E3$ Isomer in Ir^{191}*

J. W. Mihelich,† M. McKeown, and M. Goldhaber

Brookhaven National Laboratory, Upton, New York

(Received October 15, 1954)

IT has been established[1] that Os^{191} (16 day) decays via a β transition to an excited level in Ir^{191}, followed by two γ-ray transitions in cascade (42 and 129 kev).