

VIII. ATOMIC BEAM RESEARCH

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HYPERFINE STRUCTURE OF CESIUM RADIOISOTOPES

A study is being made of possible hyperfine structure anomalies in the radioactive isotopes of cesium, Cs^{134} , Cs^{135} , and Cs^{137} , and in the stable isotope Cs^{133} . Such anomalies would appear in the comparison of ratios, for two isotopes, of the hyperfine structure separations $\Delta\nu$ with those of the nuclear g factors. In view of that fact, we have measured the following $\Delta\nu$'s:

$$\text{Cs}^{135} = 9724.023 \pm 0.015 \text{ Mc/sec}$$

$$\text{Cs}^{137} = 10,115.528 \pm 0.015 \text{ Mc/sec}$$

$$\text{Cs}^{134} = 10,473.628 \pm 0.015 \text{ Mc/sec.}$$

These values were obtained from the direct high-frequency transitions $\Delta F = \pm 1$, $\Delta m = \pm 1$ with a Zeeman effect of ± 1 , as well as from the $\Delta F = \pm 1$, $m = 0 \leftrightarrow m = 0$ transitions for Cs^{135} and Cs^{137} , and from the transitions $\Delta F = \pm 1$, $m = \pm 1/2 \leftrightarrow m = \mp 1/2$ for Cs^{134} . A stabilized klystron was used for these observations.

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