

## VII. MAGNET LABORATORY RESEARCH

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### A. THE QUADRUPOLE MOMENT OF SODIUM

The first determination of the quadrupole moment of  $\text{Na}^{23}$  by the measurement of the intervals  $F = 3$  to  $F = 2$ , and  $F = 2$  to  $F = 1$  for the excited  ${}^2P_{3/2}$  state, has been completed. The double resonance method previously described was used. The result is  $Q = +1.0 + 0.08 \times 10^{-24} \text{ cm}^2$ . A detailed report is being prepared for publication.

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### B. NUCLEAR ORIENTATION IN Hg VAPOR

An investigation of the polarization of the resonance radiation from a sample of mercury vapor enriched in  $\text{Hg}^{204}$  and another sample enriched in  $\text{Hg}^{199}$  (both of which were supplied by the Atomic Energy Commission) indicates that the cause for the previously reported failure (F. Bitter, J. Brossel: Phys. Rev. 85, 1051, 1952) to obtain nuclear orientation by the absorption of circularly polarized resonance radiation, is the imprisonment and consequent depolarization of the effective component. Present indications are that further attempts should make use of vapor pressures of the order of  $10^{-6}$  mm Hg. A report on this work is being prepared for publication.

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