

# Optical Pumping and Magnetic Resonance

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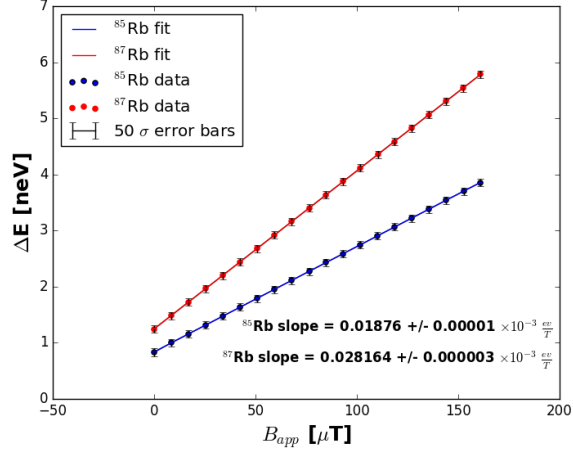


FIG. 1. Measurement of the magnetic moment of  $^{85}\text{Rb}$  and  $^{87}\text{Rb}$ .

## INTRODUCTION

Rubidium (Rb) is an alkali metal with atomic number  $Z = 37$ . Neutral states contain four entirely filled

electron shells with no net angular momentum and a single valence electron. In its ground state, the valence electron carries no orbital angular momentum:  $5^2S_{1/2}$ . In its first excited state, the valence electron carries one quantum of orbital angular momentum which can either align or anti-align with its spin contribution:  $5^2P_{1/2}$  or  $5^2P_{3/2}$ .

The energy splitting of the  $5^2S$  and  $5^2P$  states due to the Coulomb interaction with the nucleus is on the order of a few electron-volts. The degeneracy of the first excited state is lifted by the spin-orbit coupling

## REVIEW OF PREVIOUS WORK

## EXPERIMENTAL SET-UP

## MEASUREMENTS

## THEORETICAL MODEL

## COMPARISON OF DATA AND THEORETICAL MODEL

## DISCUSSION AND CONCLUSIONS

## AUTHOR CONTRIBUTIONS