

# Modern Physics Experiment Report: Zeeman Effect

Henry Su, Wen Hong Lou  
NTU Physics Department

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## Abstract

This report investigates the Zeeman Effect, a phenomenon where spectral lines are split into multiple components in the presence of a magnetic field. The experiment aims to measure the splitting and verify the theoretical predictions.

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# 1 Introduction

The Zeeman Effect, discovered by Pieter Zeeman, is a crucial phenomenon in modern physics that demonstrates the interaction between magnetic fields and atomic energy levels. This section introduces the theoretical background and significance of the Zeeman Effect.

## 2 Theory

### 2.1 Zeeman effect

The Zeeman effect is the splitting of hyper energy state with the presence of external magnetic field. We can denote the magnetic displacement as  $H = \mu B$

## 3 Experimental Setup

THIs is me. Describe the f used, including the spectrometer, light source, and magnetic field generator. Include a diagram if possible:

## 4 Procedure

Outline the steps taken to perform the experiment, including calibration, data collection, and analysis.

## 5 Results

Present the observed spectral line splitting and compare it with theoretical predictions. Include tables and graphs where necessary.

## 6 Discussion

Analyze the results, discuss sources of error, and evaluate the agreement between experimental and theoretical values.

## 7 Conclusion

Summarize the findings and their implications for understanding the Zeeman Effect.

## References

List all references used in the report, formatted appropriately.