

Determination of the target asymmetry T in η' photoproduction

JAKOB MICHAEL KRAUSE

Masterarbeit in Physik
angefertigt im Helmholtz-Institut für Strahlen- und
Kernphysik

vorgelegt der
Mathematisch-Naturwissenschaftlichen Fakultät
der
Rheinischen Friedrich-Wilhelms-Universität
Bonn

Sep 2022

DRAFT

I hereby declare that this thesis was formulated by myself and that no sources or tools other than those cited were used.

Bonn,
Date

.....
Signature

1. Gutachter: JUN. PROF. DR. ANNIKA THIEL
2. Gutachterin: Prof. Dr. TBD

Contents

1	Introduction	1
1.1	The Standard Model of Particle Physics	1
1.2	Photoproduction of Pseudoscalar Mesons	1
1.3	Polarization Obervables and the Complete Experiment	2
1.4	Motivation and Structure of this Thesis	2
2	Experimental Setup	3
2.1	The Electron Stretcher Accelerator ELSA	3
2.2	Production of (polarized) high energy photon beam	3
2.3	Beam Target	3
2.4	Calorimeters	3
2.5	Trigger	3
A	Useful information	7
	Bibliography	9
	List of Figures	11
	List of Tables	13

DRAFT

Introduction

1.1 The Standard Model of Particle Physics

A summary of the SM can be found in figure 1.1.

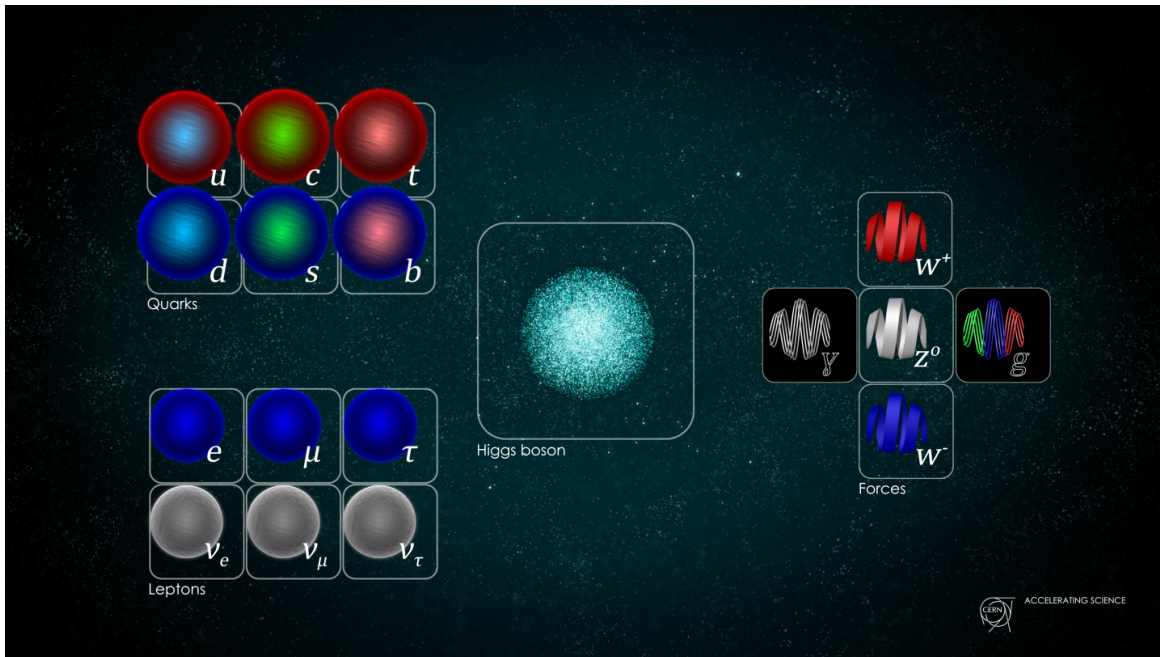


Figure 1.1: Standard Model of Particle Physics, taken from [Dom]

1.2 Photoproduction of Pseudoscalar Mesons

$$\int_0^\infty \frac{\sin \alpha \beta x}{\gamma x}$$

1.3 Polarization Obervables and the Complete Experiment

bla

1.4 Motivation and Structure of this Thesis

bla

Experimental Setup

Here comes the very good text.

2.1 The Electron Stretcher Accelerator ELSA

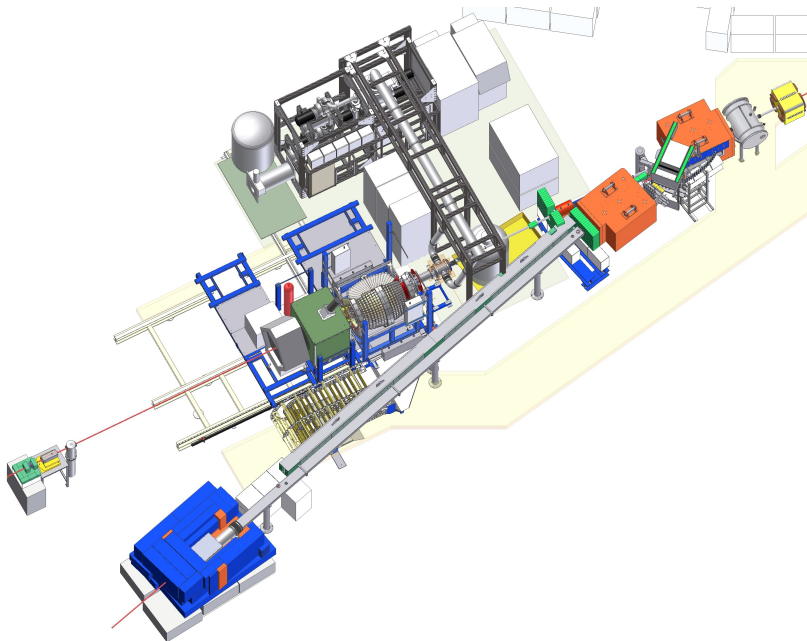


Figure 2.1: Overview of the CBELSA/TAPS experiment [Wal]

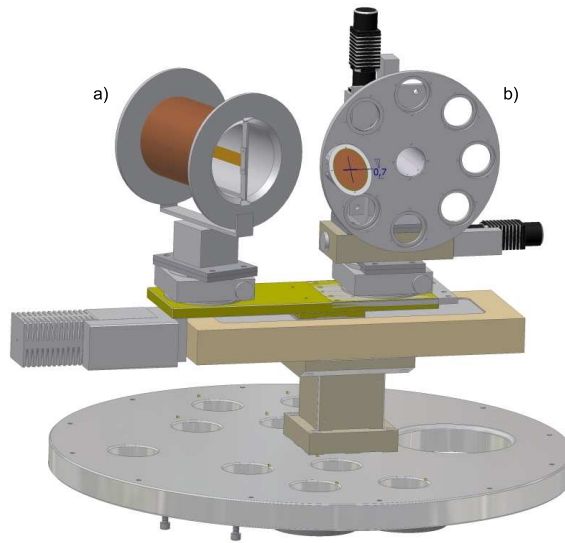


Figure 2.2: [Wal]

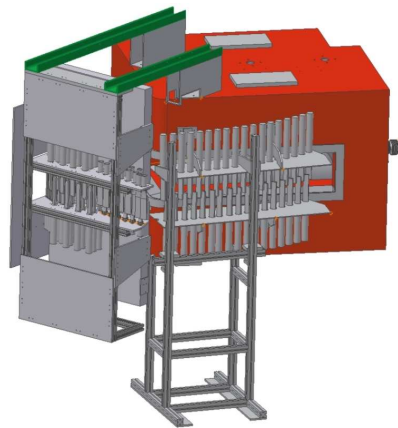


Figure 2.3: [Wal]



Figure 2.4: [Wal]

2.2 Production of (polarized) high energy photon beam

2.3 Beam Target

2.4 Calorimeters

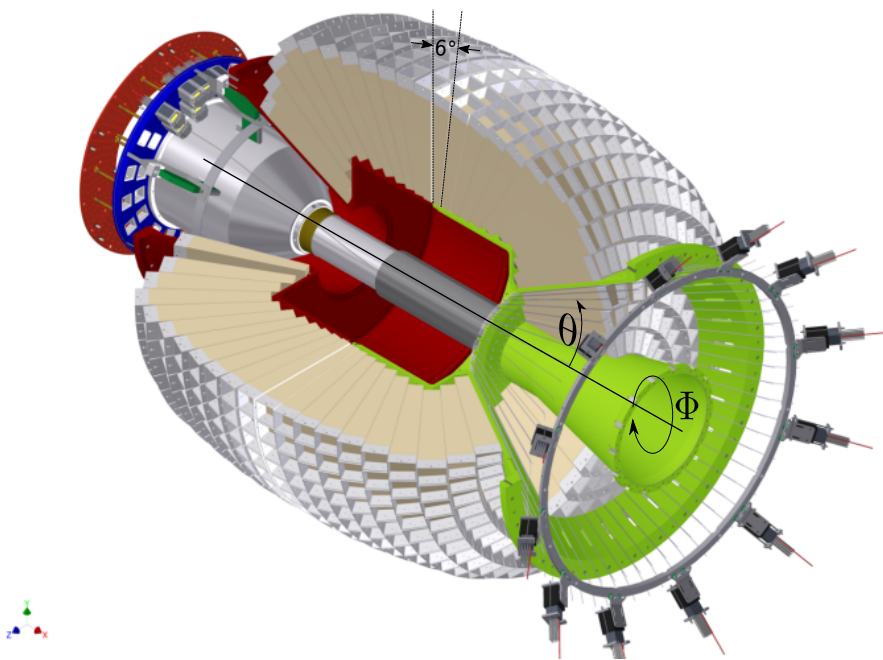


Figure 2.5: D. WALTHER in [Urb17]

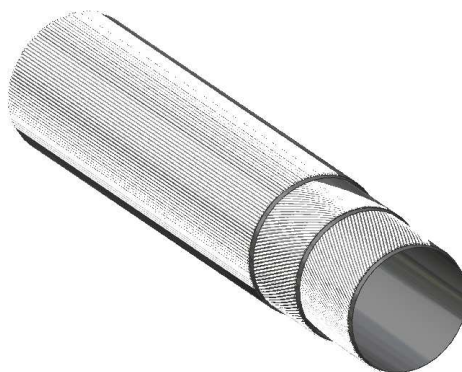


Figure 2.6: [Wal]

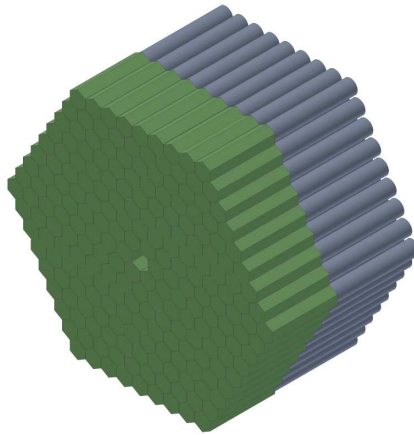


Figure 2.7: [Wal]

2.5 Trigger

Useful information

In the appendix you usually include extra information that should be documented in your thesis, but not interrupt the flow.

The L^AT_EX WikiBook [[latexwiki](#)] is a useful source of information on L^AT_EX.

Bibliography

- [Dom] D. Dominguez, *Particles of the Standard Model of particle physics*, URL: <https://home.cern/science/physics/standard-model> (visited on 27/09/2021) (cit. on p. 1).
- [Fro] F. Frommberger, *Electron accelerator ELSA, at the Physikalischen Institut of the Rheinischen Friedrich-Wilhelms-Universität Bonn*, URL: https://www-elsa.physik.uni-bonn.de/index_en.html (visited on 27/09/2021).
- [Wal] D. Walther, *Crystal Barrel, A 4π photon spectrometer*, URL: <https://www.cb.uni-bonn.de> (visited on 27/09/2021) (cit. on pp. 4–6).
- [Urb17] M. Urban, *Design eines neuen Lichtpulsersystems sowie Aufbau und Inbetriebnahme der neuen APD Uaslese für das Crystal-Barrel-Kalorimeter*, Dissertation: Rheinische Friedrich-Wilhelms-Universität Bonn, 2017 (cit. on p. 5).

List of Figures

1.1	Standard Model of Particle Physics, taken from [Dom]	1
2.1	Overview of the CBELSA/TAPS experiment [Wal]	4
2.2	[Wal]	4
2.3	[Wal]	5
2.4	[Wal]	5
2.5	D. WALTHER in [Urb17]	5
2.6	[Wal]	6
2.7	[Wal]	6

List of Tables
