ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

MASTER THESIS

Evaluation of optical aberrations using Phase Diversity

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A thesis submitted in fulfillment of the requirements
for the degree of Master in Applied Physics

in the

Astrophysics laboratory
Basic Sciences

October 27, 2017

Declaration of Authorship

I, Jordan VOIRIN, declare that this thesis titled, "Evaluation of optical aberrations using Phase Diversity" and the work presented in it are my own. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University.

- Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.

- Where I have consulted the published work of others, this is always clearly attributed.

- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.

- I have acknowledged all main sources of help.

- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

Signed:

Date:

"Thanks to my solid academic training, today I can write hundreds of words on virtually any topic without possessing a shred of information, which is how I got a good job in journalism."

Dave Barry

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Abstract

Physics
Basic Sciences

Master in Applied Physics

Evaluation of optical aberrations using Phase Diversity

by Jordan VOIRIN

The Thesis Abstract is written here (and usually kept to just this page). The page is kept centered vertically so can expand into the blank space above the title too. . .

Acknowledgements

The acknowledgments and the people to thank go here, don't forget to include your project advisor. . .

Contents

List of Figures

List of Tables

List of Abbreviations

LAH　List Abbreviations Here
WSF　What (it) Stands For

Physical Constants

Speed of Light $c_0 = 2.997\,924\,58 \times 10^8 \, \mathrm{m\,s^{-1}}$ (exact)

List of Symbols

a	distance	m
P	power	$W\,(J\,s^{-1})$
ω	angular frequency	rad

For/Dedicated to/To my...

Chapter 1

Introduction

???

Chapter 2

Phase Diversity Experiment

2.1 Theoretical Background

2.2 Experimental Setup

The design of the experiment was already done by Bouxin (2017). I built the setup according to her plans and specification.

The experiment is mounted on a pressurized legs optical table. The setup contains six components : a light source, an entrance pupil, an imaging system, a converging lens to focus the beam on the camera, a camera and a wavefront sensor.

2.3 Results

This section presents the results of the phase diversity experiment, with the introduction of different sources of aberration.

2.3.1 Astigmatism

The first aberration studied in this work is the astigmatism aberration introduced by a tilted parallel plane plate (link to section). A parallel plane plate introduces astigmatism in addition to the defocus introduced by a plate perpendicular to the optical axis. The astigmatism is due to the fact that symmetric rays with respect to the optical axis have an optical path difference.

Appendix A

Frequently Asked Questions

A.1 How do I change the colors of links?

The color of links can be changed to your liking using:

    `\hypersetup{urlcolor=red}`, or

    `\hypersetup{citecolor=green}`, or

    `\hypersetup{allcolor=blue}`.

If you want to completely hide the links, you can use:

    `\hypersetup{allcolors=.}`, or even better:

    `\hypersetup{hidelinks}`.

If you want to have obvious links in the PDF but not the printed text, use:

    `\hypersetup{colorlinks=false}`.

Bibliography

Bouxin, A. (2017). "Phasor diversity to measure the static aberrations of an optical system". MA thesis. HEIG-VD.