



## MASTER RESEARCH INTERNSHIP



## BIBLIOGRAPHIC REPORT

---

### First Integrals for Planar Vector Fields

---

**Domain:** Symbolic Computation - Mathematical Software

*Author:*  
Ophélia DENIS

*Supervisor:*  
Khalil GHORBAL  
First\_Name NAME of your second  
supervisor  
Hycomes - Inria

**Abstract:** write your abstract here

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Planar Vector Fields</b>	<b>1</b>
2.1	First integrals . . . . .	1
2.2	Darboux Polynomials . . . . .	1
<b>3</b>	<b>Computing first integrals</b>	<b>1</b>
3.1	Other methods and their limits . . . . .	1
<b>4</b>	<b>the Extactic method</b>	<b>1</b>
4.1	definition . . . . .	1
4.2	what is done wrt state of the art in implementation and why this internship matter . . . . .	1
<b>5</b>	<b>Physical models</b>	<b>1</b>
5.1	Relation between what exists/what this brings . . . . .	1
<b>6</b>	<b>Conclusion</b>	<b>1</b>

# **1 Introduction**

Why we care? Physical modelling etc

## **2 Planar Vector Fields**

2.1 First integrals

2.2 Darboux Polynomials

## **3 Computing first integrals**

3.1 Other methods and their limits

## **4 the Extactic method**

4.1 definition

4.2 necessary conditions

4.3 what is done wrt state of the art in implementation and why this internship matter

## **5 Physical models**

5.1 Relation between what exists/what this brings

## **6 Conclusion**

## **References**