# Master research Internship



# Bibliographic report

# First Integrals for Planar Vector Fields

**Domain: Symbolic Computation - Mathematical Software**

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**Abstract:** write your abstract here

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# 1   Introduction

Why we care? Physical modelling etc

    Introduce a running example, a simple system ([1]) so that people can follow easily both here and for the presentation

# 2   Integrability of dynamic systems

## 2.1   First integrals

## 2.2   Darboux polynomials

## 2.3   Effective methods

# 3   Effective methods

## 3.1   Reduction based method

## 3.2   Extactic method

# 4   Extactic curves

# 5   Complexity analysis

## 5.1   Theoretical analysis

## 5.2   Practical experimentation

# 6   Conclusion

# References

[1]   Khalil Ghorbal and Maxime Bridoux. "Automated Reasoning For The Existence Of Darboux Polynomials". en. In: *Proceedings of the 2024 International Symposium on Symbolic and Algebraic Computation.* Raleigh NC USA: ACM, July 2024, pp. 324–333. ISBN: 979-8-4007-0696-7. DOI: 10.1145/3666000.3669705. URL: https://dl.acm.org/doi/10.1145/3666000.3669705 (visited on 12/18/2025).