DRAFT
Primordial Black Holes and Loop Quantum Gravity: Implications for Cosmology

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Chapter 1

Introduction

This is the introduction to the thesis.

1.1 Motivation and Background

1.1.1 Cosmology

This section is based on [Baumann, 2022; Peter and Uzan, 2013] for the general introduction. The inflation part is inspired from [Baumann, 2011].

Definition 1.1.1. The Hubble parameter is defined as:

$$H \equiv \frac{\dot{a}}{a} \tag{1.1.1}$$

1.1.2 Primordial Black Holes

This section is based on [Carr et al., 2024; Bagui et al., 2023] for the PBHs and on [Chrusciel, 2023] for the basics of black holes.

1.1.3 Loop Quantum Gravity

This section is based on [Rovelli and Vidotto, 2014]

1.1.4 Loop Quantum Cosmology

Question 1.1.1. *Find an article*

1.1.5 Remnants

This section is based on [Rovelli and Vidotto, 2024].

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Bibliography

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Appendix A

Mathematical Details of LQC Derivations

Mathematical Details of LQC Derivations

Appendix B

Numerical Codes and Data

Here is the mathematica notebook used for this master thesis:

```
(* ::Package:: *)

(* ::Title:: *)
(*PBH - v1*)


(* ::Subtitle:: *)
(*Constants*)


(* ::Input:: *)
(*(* Taken from the PDG, in SI *)*)
(*c = 299792458                                              (*speed of light
    in vacuum, [m s^-1]*)*)
(*h = 6.62607015*10^-34                          (*Planck constant [Js]*)*)
(*hbar = h/2*Pi                                           (*reduced Planck
   constant [Js]*)*)
(*Q_e = 1*)
(**)
(**)
```