



University of Groningen

Formal aspects of cosmological models: higher derivatives and non-linear realisations

Klein, Remko

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2018

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Klein, R. (2018). Formal aspects of cosmological models: higher derivatives and non-linear realisations. [Groningen]: University of Groningen.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Propositions accompanying the PhD thesis

‘Formal aspects of cosmological models: higher derivatives and non-linear realisations’

by Remko Klein

1. Transformations involving derivatives naturally appear when dealing with higher derivative theories and/or non-linearly realised space-time symmetries. [*Chapter 2*]
2. Ostrogradsky’s theorem strongly restricts the appearance of higher derivatives in potentially viable physical models. [*Chapter 3*]
3. Healthy higher derivative theories can be classified according to the complexity of their constraints, namely trivial, linear or non-linear. [*Chapter 4*]
4. Large classes of healthy higher derivative theories can be put in a manifestly healthy first order form by performing suitable (derivative dependent) redefinitions of the fields, but doing so generically obscures other properties (such as symmetries) of the theory. [*Chapter 4*]
5. The existence of inverse Higgs constraints complicates the universality question for non-linear realisations of space-time symmetries; a thorough investigation of transformations involving derivatives might offer a solution. [*Chapter 5*]
6. Systematic analysis of Lie algebras in combination with the coset construction for non-linear realisations provides an efficient route to classifications of theories in many different contexts, ranging from inflation to condensed matter physics. [*Chapters 5 & 6*]