

# GLOBAL DYNAMICS OF THE HOŘAVA-LIFSHITZ COSMOLOGY WITH NON-ZERO CURVATURE

FABAO GAO<sup>1,2</sup>, AND JAUME LLIBRE<sup>2</sup>

ABSTRACT. The global dynamics of a cosmological model based on Hořava-Lifshitz gravity in the presence of curvature is described by using the qualitative theory of differential equations.

## 1. INTRODUCTION

In recent years Hořava [1] proposed a spacetime asymmetric gravitational theory similar to Lifshitz's scalar field theory, also known as Hořava-Lifshitz gravity. This theory has inspired a great deal of research for its applications in cosmology and black hole physics (see [2]-[17] or the review articles [18], [19] and the references therein).

Here we will investigate the global dynamics of the Hořava-Lifshitz scalar field cosmology under the Friedmann-Lemaître-Robertson-Walker background spacetime in the presence of curvature and no cosmological constant term. The corresponding dimensionless field equations admit the following form

$$(1) \quad \begin{aligned} \frac{dx}{dt} &= x(3x^2 - 2z^2 - 3) + \sqrt{6}s(1 - x^2 + z^2), \\ \frac{dz}{dt} &= z(3x^2 - 2z^2 - 2), \\ \frac{ds}{dt} &= -2\sqrt{6}xf(s), \end{aligned}$$

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*Key words and phrases.* Hořava-Lifshitz; Global dynamics; Cosmology; Poincaré compactification.