

The Dynamics of The Universe and The Disformal Coupling Between Dark Energy and Dark Matter

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Introduction

- ▶ This work we study the interaction between dark matter and dark energy.
- ▶ The interaction between dark energy and dark matter can arise from the modified theories of gravity through frame transformations.
- ▶ The general frame transformation is disformal transformation¹,

$$\bar{g}_{\mu\nu} = C(\phi, X)g_{\mu\nu} + D(\phi, X)\phi_{,\mu}\phi_{,\nu} \quad (1)$$

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- ▶ We obtain the EoM for scalar field ϕ as

$$\phi_{;\alpha}^{\alpha} - V_{,\phi} = Q, \quad (3)$$

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- ▶ We have found new fixed points dubbed “disformal fixed points”.

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- ▶ Nevertheless, the disformal fixed points exist when disformal coefficient depend on kinetic terms of the scalar field.
- ▶ The disformal fixed points can be stable at late time of the universe

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Thank You