量子物理学・ナノサイエンス第 238 回セミナー

Spatially covariant gravity with velocity of the lapse function

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概　要

Covariant scalar-tensor theories of gravity can be reformulated as spatially covariant gravity (SCG) theories in the unitary gauge. In the previous work [1], [2], an important ingredient --- time derivative of the lapse function --- was overlooked. Based on our recent paper [3], I will discuss how to build SCG theories with kinetic terms for both the spatial metric and the lapse function. Generally such kind of theories propagate 4 physical degrees of freedom, one of which is a ghost mode. Through a detailed Hamiltonian analysis, we derive two conditions that the Lagrangian must satisfy in order to get rid of this ghost mode. I will also discuss some simple examples as well as cosmological implications.

[1] X. Gao, Phys. Rev. D **90,** 081501 (2014), arXiv:1406.0822 [gr-qc]
[2] X. Gao, Phys. Rev. D **90**, 104033 (2014), arXiv:1409.6708 [gr-qc]
[3] X. Gao, Z. b. Yao, arXiv:1806.02811[gr-qc]

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