

# Modified F(R) Horava-Lifshitz gravity: a way to accelerating FRW cosmology

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We propose a general approach for the construction of modified gravity which is invariant under foliation-preserving diffeomorphisms. Special attention is paid to the formulation of modified F(R) Horava-Lifshitz gravity, whose Hamiltonian structure is studied. The consistency of spatially-flat FRW equations is demonstrated. The analysis of de Sitter solutions for several versions of this theory indicates that the unification of the early-time inflation with the late-time acceleration is possible. It is shown that a special choice of parameters for such a theory leads to the same spatially-flat FRW equations as in the case of traditional F(R)-gravity. Finally, an essentially most general modified Horava-Lifshitz gravity is proposed, motivated by its fully diffeomorphism-invariant counterpart, with the restriction that the action does not contain derivatives higher than the second order with respect to the time coordinate.

Comments: LaTeX 9 pages, discussion is expanded, hamiltonian analysis is extended, references are added.

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