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Abstract

Accelerated phases of the Universe, in some modified theories of gravity models, are investigated in this thesis. Late time cosmic acceleration has been investigated in the frameworks of Galileon theory and extended dRGT nonlinear massive gravity theories. Cosmological viability of quintessential inflation models, which can unify inflation and late time acceleration, is also investigated for both canonical and noncanonical scalar fields.

Galileon Lagrangian is well motivated from the decoupling limit of Dvali-Gabadadze-Porrati (DGP) action. We have investigated a cubic Galileon model with potential for both minimal and nonminimal cases. While for nonminimal case we have considered tracker model, thawing model is investigated for minimal case. For both the cases model parameters are constraint by some cosmological data. Comparison with the quintessence model is also done for minimal case.

We have also investigated the cosmological scenario in extended massive gravity theories, *e.g.*, quasidilaton nonlinear massive gravity and mass-varying massive gravity. In quasidilaton massive gravity, both minimal and nonminimal cases are considered but for

mass-varying massive gravity only nonminimal scenario is investigated. Cosmological viability of the models is checked through detailed dynamical analysis. For mass varying massive gravity we tried to see whether the nonminimal coupling can give rise to a field dependent mass in the Einstein frame along with a viable cosmology.

Unified models of inflation and late time cosmic acceleration, *i.e.*, quintessential inflation models are investigated for both canonical and noncanonical scalar fields. Nonminimal coupling of the scalar field with massive neutrinos is considered for both the cases which is responsible for the late time acceleration. Inflationary observables, for both the models, are compared with the recent cosmological results. In both the cases inflation and late time cosmic acceleration are successfully connected by a single scalar field with viable intermediate phases of the Universe, *i.e.*, radiation and matter dominated eras.