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## Late time cosmology with derivatives of matter Lagrangian

*Friday, 9 July 2021 07:10 (20 minutes)*

A class of modified gravity theories with higher order derivative terms of a function of the matter Lagrangian  $f(L_m)$  is considered. We will consider the Newtonian limit of the theory and show that the model predicts the standard Poisson equation for a massive test particle due to the higher order nature of the derivative matter coupling. Generally the energy momentum tensor is not conserved, leading to the fifth force similar to  $f(R, T)$  theories. We will however show that in the FRW background the energy-momentum tensor is conserved. Cosmological implications of this model with different functions of the matter Lagrangian  $f$  will be investigated in details and we will show that current observational data can be satisfied. Evolution of the matter density perturbation in the longitudinal gauge is also considered for dust matter sources and we will show that the observational data can be satisfied in this model.

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**Session Classification:** Extended Theories of Gravity and Quantum Cosmology

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