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Pablo Cano: f(Lovelock) theories of gravity

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f(Lovelock) gravities are simple generalizations of the usual f(R) and Lovelock theories in which the gravitational action depends on an arbitrary function of the corresponding dimensionally-extended Euler densities. We study several aspects of these theories in general dimensions. We start by identifying the generalized boundary term which makes the gravitational variational problem well-posed. Then, we show that these theories are equivalent to certain scalar-tensor theories and how this relation is crucially characterized by the Hessian of f. We also study the linearized equations of the theory on a general maximally symmetric background. In particular, we show that these theories do not incorporate massive gravitons in their spectrum. Finally, we construct new analytic asymptotically AdS and Lifshitz black hole solutions for a particular Einstein plus f(Lovelock) theory. These generalize previous solutions obtained in R2 gravity and posses interesting thermodynamic properties, such as vanishing mass and entropy.