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The formulation interpolation: the quasi-Palatini approach to modified gravity

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Distinct formulations of nonminimal models have been a leading motivating factor for the development of alternative theories of gravity. The metric and Palatini formulations, understood to be equivalent in minimally coupled models, can lead to physically distinct theories when a nonminimal coupling is introduced. The choice of formulation, made before the action is written down, is a discrete one, and it is therefore interesting to consider the possibility of interpolating between the resulting actions in order to arrive at a continuous class of theories. As such, we propose the "quasi-Palatini" formulation, which gives rise to a family of scalar-tensor theories with distinct observational signatures indexed by a single parameter that measures the relative "Palatininess" of the model. We demonstrate that this approach can be used to enhance the robustness of nonminimal models such as Higgs inflation, and that it can be used to motivate the pole structure inherent in alpha-attractors. We finally discuss how this interpolation may be extended to teleparallel theories, and how the relative strength of the boundary terms gives rise to hyperformulations of the same underlying model with distinct physics.

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