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The quasi-static approximation in Horndeski models

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The quasi-static approximation (QSA) is a useful tool to get a quick and clear physical understanding of the phenomenology of modified gravity which is encoded in two functions (of scale and time): the effective gravitational constant (describing the modified evolution of matter perturbations) and the slip (parametrizing the relations between the two gravitational potentials). This approximation is often used to put constraints on cosmological models using phenomenological expressions. In this talk I will consider three different formulations based on the QSA for Horndeski models and assess their performance on some cosmological observables and assess the range of validity of this approximation. I will also highlight why different schemes lead to different expressions on very large scales and how we can improve them.

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