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Present and future constraints on general theories of Dark Energy after the GW observations

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The Effective Field Theory of Dark Energy (EFToDE) is a powerful formalism that classifies and unifies theories of modified gravity according to their imprints on the cosmological background and structure formation and links these properties to specific operators in the action. It also contains the famous Horndeski theory as a subset. Despite the fact that the original functional parameter space is very large, due to the free functions involved, recent LSS and CMB observations and especially the GW+EM observation of GW170817, have managed to rule out large parts of the theory. Other corners of parameter space have been excluded due to stability and consistency considerations. In this talk I will review the present constraints on EFT theories based on CMB+LSS data and some future forecasts for Euclid, DESI and SKA, taking into account different parametrizations, which unsurprisingly change the results in a non-trivial way.

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