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A new procedure to distinguish between dark energy models and modified gravity models.[1] MUSTAPHA ISHAK, University of Texas at Dallas, AMOL UPADHYE, Princeton University, DAVID SPERGEL, Princeton University — The acceleration of the expansion of the universe is one of the most important and challenging problems in physics. It is important to determine if the cosmic acceleration is due to a dark energy component in the universe or if it is due to a modification in the gravity sector. We report here results on a procedure that we proposed recently and that will allow one to make such a distinction. The procedure goes one important step further than constraining the equation of state. It uses different combinations of simulated data of CMB, Weak Gravitational Lensing, and Supernovae. We explored the fact that the effect of dark energy on the expansion history must be consistent with the effect of dark energy on the growth factor of large-scale structure. The procedure is able to detect inconsistencies in this relation and thus provides a test to detect signatures of modified gravity models.

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