Litmus tests of the flat ΛCDM model and model-independent measurement of $H_0 r_{\rm d}$ with LSST and DESI

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In order to quantify the ability of Stage-IV surveys to test the concordance model in a model-independent way, we reconstruct the cosmic expansion history using simulated type Ia supernovae from a one-year LSST observation. We then combine these reconstructions with simulated DESI 5-year baryon acoustic oscillation data to perform litmus tests of the concordance model, including the FLRW metric and the curvature, and dark energy as the concordance model. We show that the combination of DESI+LSST will allow to constrain the curvature parameter to a few percent without making any assumption regarding the dark energy model.