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Signature of dark energy in galaxy power spectrum on large cosmological scales

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The late-time cosmic acceleration of our Universe can be explained by postulating Dark Energy (DE) or by the modified theories of gravity. In structure formation, the presence of DE slows down the growth rate of the overdensities which affect cosmological quantities like growth factor, matter power spectrum etc. While ΛCDM (i.e cosmological constant), has no perturbation in the DE component, other DE candidates (with evolving equation of state) may have perturbations. The effect of such perturbations to the DE density is shown to be non-negligible on large scales and impacts large scale galaxy power spectrum. This effect can therefore be used to distinguish different dark energy models from the ΛCDM model.

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