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Constraining the interacting vacuum scenario

It is well-known that there are problems with the standard model of cosmology that hint at possible physics beyond the ΛCDM paradigm. In particular, the 4σ tension in the values of H_0 coming from CMB and supernovae measurements is motivation enough to consider alternative cosmological models.

In this talk, I will introduce one such model, the interacting vacuum scenario. Beginning with the covariant theory of the interaction, I will show the linear theory of perturbations in the scenario before specialising to the spatially flat FLRW background. I will describe how the interaction parameter can be constrained using MCMC methods and show the results of our investigation for both a constant and a dynamical interaction, focusing on the effects of the interaction on the cosmological tensions.

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