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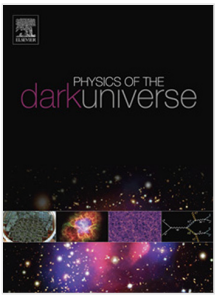

Direct reconstruction of dynamical dark energy from observational Hubble parameter data

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Direct Reconstruction of dynamical dark energy from observational Hubble Parameter data template☆

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Abstract

Reconstructing the evolution history of the dark energy equation of state parameter $w(z)$ directly from observational data is highly valuable in cosmology, since it contains substantial clues in understanding the nature of the accelerated expansion of the Universe. Many works have focused on reconstructing $w(z)$ using Type Ia supernova data, however, only a few studies pay attention to Hubble parameter data. In the present work, we explore the merit of Hubble parameter data and make an attempt to reconstruct $w(z)$ from them through the principle component analysis approach. We find that current Hubble parameter data perform well in reconstructing $w(z)$; though, when compared to supernova data, the data are scant and their quality is worse. Both ΛCDM and evolving $w(z)$ models can be constrained within 10% at redshifts $z \lesssim 1.5$ and even 5% at redshifts $0.1 \lesssim z \lesssim 1$ by using simulated $H(z)$ data of observational quality.

Keywords: `Dark Energy`, Reconstruction, Nonparametric Model, Observational Hubble Parameter Data

☆Fully documented templates are available in the elsarticle package on CTAN.

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