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How predictions of cosmological models depend on Hubble parameter data sets

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Abstract. We explore recent estimations of the Hubble parameter H depending on redshift z, which include 31 $H(z)$ data points measured from differential ages of galaxies and 26 data points, obtained with other methods. We describe these data together with Union 2.1 observations of Type Ia supernovae and observed parameters of baryon acoustic oscillations with 2 cosmological models: the standard cold dark matter model with the Λ term (ΛCDM) and the model with generalized Chaplygin gas (GCG). For these models with different sets of $H(z)$ data we calculate two-parameter and one-parameter distributions of χ^2 functions for all observed effects, estimate optimal values of model parameters and their 1σ errors. For both considered models the results appeared to be strongly depending on a choice of Hubble parameter data sets if we use all 57 $H(z)$ data points or only 31 data points from differential ages. This strong dependence can be explained in connection with 4 $H(z)$ data points with high redshifts $z > 2$.

Keywords: cosmological model, Chaplygin gas, Hubble parameter, Type Ia supernovae, baryon acoustic oscillations

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