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Constraints on extended quintessence from high-redshift Supernovae

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abstract

We obtain constraints on quintessence models from magnitude-redshift measurements of 172 type Ia Supernovae. The considered quintessence models are ordinary quintessence, with Ratra-Peebles and SUGRA potentials, and extended quintessence with a Ratra-Peebles potential. We compute confidence regions in the $\Omega_{m0} - \alpha$ plane and find that for SUGRA potentials it is not possible to obtain useful constraints on these parameters; for the Ratra-Peebles case, both for the extended and ordinary quintessence we find $\alpha > 1.1$, at the 1σ level. We also consider simulated dataset for the SNAP satellite for the same models: again, for a SUGRA potential it will not be possible to obtain constraints on α , while with a Ratra-Peebles potential its value will be determined with an error smaller than unity. We evaluate the inaccuracy made by approximating the time evolution of the equation of state with a linear or constant w , instead of using its exact redshift evolution.