

## **Beyond the cosmological standard model**

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The 'standard' model of cosmology is founded on the basis that the expansion rate of the universe is accelerating at present — as was inferred from the Hubble diagram of Type Ia supernovae. There exists now a much bigger database of supernovae so we can perform rigorous statistical tests to check whether these 'standardisable candles' indeed indicate cosmic acceleration. Taking account of the empirical procedure by which corrections are made to their absolute magnitudes to allow for the varying shape of the light curve and extinction by dust, we find, rather surprisingly, that the data are still quite consistent with a constant rate of expansion. This motivates discussion of the foundations of the standard cosmological model, in particular whether dark energy really exists.