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Fitting the DESI BAO Data with Dark Energy Driven by the Cohen–Kaplan–Nelson Bound

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Gravity constrains the range of validity of quantum field theory. As has been pointed out by Cohen, Kaplan, and Nelson (CKN), such effects lead to interdependent ultraviolet and infrared cutoffs that may stabilize the dark energy of the universe against quantum corrections, if the infrared cutoff is set by the Hubble horizon. As a consequence of the cosmic expansion, this argument implies a time-dependent dark energy density. We confront this idea with the latest data from DESI BAO, Hubble and supernova measurements. We find that the CKN model provides a better fit to the data than the ΛCDM model and can compete with other models of time-dependent dark energy that have been studied so far.

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