



Constraining dynamical dark energy with a divergence-free parametrization in the presence of spatial curvature and massive neutrinos

Hong Li, Xin Zhang

(Submitted on 18 Feb 2012 (v1), last revised 11 Jun 2012 (this version, v3))

In this paper, we report the results of constraining the dynamical dark energy with a divergence-free parameterization, $w(z) = w_0 + w_a \frac{\ln(2+z)}{1+z - \ln 2}$, in the presence of spatial curvature and massive neutrinos, with the 7-yr WMAP temperature and polarization data, the power spectrum of LRGs derived from SDSS DR7, the Type Ia supernova data from Union2 sample, and the new measurements of H_0 from HST, by using a MCMC global fit method. Our focus is on the determinations of the spatial curvature, Ω_k , and the total mass of neutrinos, $\sum m_\nu$, in such a dynamical dark energy scenario, and the influence of these factors to the constraints on the dark energy parameters, w_0 and w_a . We show that Ω_k and $\sum m_\nu$ can be well constrained in this model; the 95% CL limits are: $-0.0153 < \Omega_k < 0.0167$ and $\sum m_\nu < 0.56$ eV. Comparing to the case in a flat universe, we find that the error in w_0 is amplified by 25.51%, and the error in w_a is amplified by 0.14%; comparing to the case with a zero neutrino mass, we find that the error in w_0 is amplified by 12.24%, and the error in w_a is amplified by 1.63%.

Comments: 5 pages, 2 figures; discussions added; accepted for publication in Physics Letters B

Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO)**; General Relativity and Quantum Cosmology (gr-qc); High Energy Physics - Phenomenology (hep-ph); High Energy Physics - Theory (hep-th)

Journal reference: Physics Letters B 713 (2012) 160-164

Cite as: **arXiv:1202.4071 [astro-ph.CO]**
(or **arXiv:1202.4071v3 [astro-ph.CO]** for this version)

Download:

- PDF
- PostScript
- Other formats

Current browse context:

astro-ph.CO

< prev | next >

new | recent | 1202

Change to browse by:

astro-ph

gr-qc

hep-ph

hep-th

References & Citations

- INSPIRE HEP
(refers to | cited by)
- NASA ADS

Bookmark (what is this?)



Submission history

From: Xin Zhang [[view email](#)]

[\[v1\]](#) Sat, 18 Feb 2012 11:47:51 GMT (149kb)

[\[v2\]](#) Sat, 28 Apr 2012 14:37:17 GMT (145kb)

[\[v3\]](#) Mon, 11 Jun 2012 08:05:56 GMT (146kb)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).