



Probing bulk viscous matter-dominated models with Gamma-ray bursts

A. Montiel, N. Bretón

(Submitted on 1 Jul 2011)

In this paper we extend the range of consistency of a constant bulk viscosity model to redshifts up to $z \sim 8.1$. In this model the dark sector of the cosmic substratum is a viscous fluid with pressure $p = -\zeta \theta$, where θ is the fluid-expansion scalar and ζ is the coefficient of bulk viscosity. Using the sample of 59 high-redshift GRBs reported by Wei (2010), we calibrate GRBs at low redshifts with the Union 2 sample of SNe Ia, avoiding then the circularity problem. Testing the constant bulk viscosity model with GRBs we found the best fit for the viscosity parameter $\tilde{\zeta}$ in the range $0 < \tilde{\zeta} < 3$, being so consistent with previous probes; we also determined the deceleration parameter q_0 and the redshift of transition to accelerated expansion. Besides we present an updated analysis of the model with CMB5-year data and CMB7-year data, as well as with the baryon acoustic peak BAO. From the statistics with CMB it turns out that the model does not describe in a feasible way the far far epoch of recombination of the universe, but is in very good concordance for epochs as far as $z \sim 8.1$ till present.

Comments: 11 pages, 3 figures, submitted to JCAP
 Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO)**; High Energy Physics - Theory (hep-th)
 Journal reference: JCAP08 (2011) 023
 DOI: [10.1088/1475-7516/2011/08/023](https://doi.org/10.1088/1475-7516/2011/08/023)
 Cite as: [arXiv:1107.0271](https://arxiv.org/abs/1107.0271) [astro-ph.CO]
 (or [arXiv:1107.0271v1](https://arxiv.org/abs/1107.0271v1) [astro-ph.CO] for this version)

Submission history

From: Ariadna Montiel [[view email](#)]
 [v1] Fri, 1 Jul 2011 16:43:48 GMT (318kb)

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

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

astro-ph.CO

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[astro-ph](#)
[hep-th](#)

References & Citations

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

Bookmark ([what is this?](#))

