



Peculiar motions, accelerated expansion and the cosmological axis

Christos G. Tsagas

(Submitted on 20 Jul 2011 (v1), last revised 15 Sep 2011 (this version, v3))

Peculiar velocities change the expansion rate of any observer moving relative to the smooth Hubble flow. As a result, observers in a galaxy like our Milky Way can experience accelerated expansion within a globally decelerating universe, even when the drift velocities are small. The effect is local, but the affected scales can be large enough to give the false impression that the whole cosmos has recently entered an accelerating phase. Generally, peculiar velocities are also associated with dipole-like anisotropies, triggered by the fact that they introduce a preferred spatial direction. This implies that observers experiencing locally accelerated expansion, as a result of their own drift motion, may also find that the acceleration is maximised in one direction and minimised in the opposite. We argue that, typically, such a dipole anisotropy should be relatively small and the axis should probably lie fairly close to the one seen in the spectrum of the Cosmic Microwave Background.

Comments: Typos corrected. Published version

Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO)**; General Relativity and Quantum Cosmology (gr-qc)

Journal reference: Phys.Rev.D84:063503,2011

DOI: [10.1103/PhysRevD.84.063503](https://doi.org/10.1103/PhysRevD.84.063503)

Cite as: [arXiv:1107.4045](https://arxiv.org/abs/1107.4045) [astro-ph.CO]

(or [arXiv:1107.4045v3](https://arxiv.org/abs/1107.4045v3) [astro-ph.CO] for this version)

Submission history

From: Christos Tsagas [[view email](#)]

[v1] Wed, 20 Jul 2011 17:43:15 GMT (20kb)

[v2] Wed, 10 Aug 2011 15:31:05 GMT (20kb)

[v3] Thu, 15 Sep 2011 19:54:08 GMT (20kb)

[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](#)

[gr-qc](#)

References & Citations

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

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



