



# The intrinsic dispersion of the Faber-Jackson relation for early-type galaxies as function of the mass and redshift

A. Nigoche-Netro, J. A. L. Aguerri, P. Lagos, A. Ruelas-Mayorga, L. J. Sánchez, C. Muñoz-Tuñón, A. Machado

(Submitted on 29 Jul 2011)

**Aims.** Recently it has been reported that the intrinsic dispersion at constant magnitude of the structural relations from early-type galaxies is a useful tool to study the universality of these structural relations, that is to say, to study whether the structural relations depend on luminosity, wavelength, redshift and/or environment. In this work we study the intrinsic dispersion of the Faber-Jackson relation as function of the luminosity, mass and redshift.

**Methods.** We use a sample of approximately 90 000 early-type galaxies from the Sloan Digital Sky Survey (SDSS-DR7) spanning a magnitude range of 7  $m_{\text{mag}}$  in both  $g$  and  $r$  filters. We calculate the intrinsic dispersion of the Faber-Jackson relation at approximately constant magnitude and compare this at different luminosities, masses and redshifts.

**Results.** The main results are the following: i) The intrinsic dispersion of the Faber-Jackson relation depends on the luminosity, mass and redshift. ii) The distribution for brighter and more massive galaxies has smaller intrinsic dispersion than that for fainter and less massive galaxies. iii) The distribution of bright and massive galaxies at higher redshift has smaller intrinsic dispersion than those similar galaxies at low redshift.

**Conclusions.** Comparisons of the results found in this work with recent studies from the literature make us conclude that the intrinsic dispersion of the Faber-Jackson relation could depend on the history of galaxies, in other words, the intrinsic dispersion could depend on the number and nature of transformation events that have affected the galaxies along their life times, such as collapse, accretion, interaction and merging.

Comments: 18 pages, 11 figures, A&A Accepted

Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO)**

Cite as: **arXiv:1107.6017 [astro-ph.CO]**

(or **arXiv:1107.6017v1 [astro-ph.CO]** for this version)

## Download:

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

Current browse context:

astro-ph.CO

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

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

Change to browse by:

astro-ph

## References & Citations

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

## Bookmark (what is this?)



## Submission history

From: Alberto Nigoche [[view email](#)]

[v1] Fri, 29 Jul 2011 16:47:23 GMT (215kb)

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

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