



Mathematical Physics

# On generalized Cramér-Rao inequalities, generalized Fisher informations and characterizations of generalized q-Gaussian distributions

J.-F. Bercher

(Submitted on 4 Jun 2012)

This paper deals with Cramér-Rao inequalities in the context of nonextensive statistics and in estimation theory. It gives characterizations of generalized q-Gaussian distributions, and introduces generalized versions of Fisher information. The contributions of this paper are (i) the derivation of new extended Cramér-Rao inequalities for the estimation of a parameter, involving general q-moments of the estimation error, (ii) the derivation of Cramér-Rao inequalities saturated by generalized q-Gaussian distributions, (iii) the definition of generalized Fisher informations, (iv) the identification and interpretation of some prior results, and finally, (v) the suggestion of new estimation methods.

Subjects: **Mathematical Physics (math-ph)**; Statistical Mechanics (cond-mat.stat-mech); Information Theory (cs.IT)

Journal reference: J. Phys. A: Math. Theor. 45 255303 2012

DOI: [10.1088/1751-8113/45/25/255303](https://doi.org/10.1088/1751-8113/45/25/255303)

Cite as: **arXiv:1206.0567 [math-ph]**

(or [arXiv:1206.0567v1 \[math-ph\]](https://arxiv.org/abs/1206.0567v1) for this version)

## Submission history

From: Jean-François Bercher [[view email](#)]

[v1] Mon, 4 Jun 2012 09:51:07 GMT (17kb)

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

## Download:

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

Current browse context:

math-ph

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

[new](#) | [recent](#) | [1206](#)

Change to browse by:

[cond-mat](#)

[cond-mat.stat-mech](#)

[cs](#)

[cs.IT](#)

[math](#)

## References & Citations

- [NASA ADS](#)

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

