



Distances and Riemannian metrics for multivariate spectral densities

Xianhua Jiang, Lipeng Ning, Tryphon T. Georgiou

(Submitted on 7 Jul 2011)

We first introduce a class of divergence measures between power spectral density matrices. These are derived by comparing the suitability of different models in the context of optimal prediction. Distances between "infinitesimally close" power spectra are quadratic, and hence, they induce a differential-geometric structure. We study the corresponding Riemannian metrics and, for a particular case, provide explicit formulae for the corresponding geodesics and geodesic distances. The close connection between the geometry of power spectra and the geometry of the Fisher-Rao metric is noted.

Comments: 21 pages, 8 figures

Subjects: **Optimization and Control (math.OC)**; Systems and Control (cs.SY); Statistics Theory (math.ST)

MSC classes: 93E11

Cite as: [arXiv:1107.1345](#) [math.OC]

(or [arXiv:1107.1345v1](#) [math.OC] for this version)

Submission history

From: Tryphon Georgiou [[view email](#)]

[v1] Thu, 7 Jul 2011 11:12:28 GMT (233kb)

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

Download:

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

Current browse context:

math.OC

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

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

Change to browse by:

cs
 [cs.SY](#)
 math
 [math.ST](#)
 stat

References & Citations

- [NASA ADS](#)

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

