



Spectra of sparse regular graphs with loops

F. L. Metz, I. Neri, D. Bollé

(Submitted on 20 Jul 2011)

We derive exact equations that determine the spectra of undirected and directed sparsely connected regular graphs containing loops of arbitrary length. The implications of our results to the structural and dynamical properties of networks are discussed by showing how loops influence the size of the spectral gap and the propensity for synchronization. Analytical formulas for the spectrum are obtained for specific length of the loops.

Comments: 4 pages, 4 figures

Subjects: **Statistical Mechanics (cond-mat.stat-mech)**; Disordered Systems and Neural Networks (cond-mat.dis-nn); Social and Information Networks (cs.SI); Mathematical Physics (math-ph); Physics and Society (physics.soc-ph)

Journal reference: Phys. Rev. E 84, 055101(R) (2011)

DOI: [10.1103/PhysRevE.84.055101](https://doi.org/10.1103/PhysRevE.84.055101)

Cite as: [arXiv:1107.4127](https://arxiv.org/abs/1107.4127) [cond-mat.stat-mech]
(or [arXiv:1107.4127v1](https://arxiv.org/abs/1107.4127v1) [cond-mat.stat-mech] for this version)

Submission history

From: Fernando Lucas Metz [[view email](#)]

[v1] Wed, 20 Jul 2011 22:03:30 GMT (1032kb)

Which authors of this paper are endorsers?

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

Download:

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

Current browse context:

cond-mat.stat-mech

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

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

Change to browse by:

[cond-mat](#)

[cond-mat.dis-nn](#)

[cs](#)

[cs.SI](#)

[math](#)

[math-ph](#)

[physics](#)

[physics.soc-ph](#)

References & Citations

- [NASA ADS](#)

Bookmark (what is this?)

