

# Impact of nonlocal interactions in dissipative systems: towards minimal-sized localized structures

L. Gelens, G. Van der Sande, P. Tassin, M. Tlidi, P. Kockaert, D. Gomila, I. Veretennicoff, J. Danckaert

(Submitted on 8 Dec 2009)

In order to investigate the size limit on spatial localized structures in a nonlinear system, we explore the impact of linear nonlocality on their domains of existence and stability. Our system of choice is an optical microresonator containing an additional metamaterial layer in the cavity, allowing the nonlocal response of the material to become the dominating spatial process. In that case, our bifurcation analysis shows that this nonlocality imposes a new limit on the width of localized structures going beyond the traditional diffraction limit.

Comments: 4 pages, 4 figures

Subjects: **Pattern Formation and Solitons (nlin.PS)**; Optics (physics.optics)

Journal reference: Phys. Rev. A 75, 063812 (2007)

DOI: [10.1103/PhysRevA.75.063812](https://doi.org/10.1103/PhysRevA.75.063812)

Cite as: [arXiv:0912.1444v1](https://arxiv.org/abs/0912.1444v1) [nlin.PS]

## Submission history

From: Lendert Gelens [[view email](#)]

[v1] Tue, 8 Dec 2009 09:31:36 GMT (113kb,D)

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

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

## Download:

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

Current browse context:

nlin.PS

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

[new](#) | [recent](#) | [0912](#)

Change to browse by:

[nlin](#)

[physics](#)

[physics.optics](#)

## References & Citations

- [CiteBase](#)

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

[CiteULike logo](#)

[Connotea logo](#)

[BibSonomy logo](#)

[Mendeley logo](#)

[Facebook logo](#)

[del.icio.us logo](#)

[Digg logo](#)

[Reddit logo](#)