

# Formation of Random Dark Envelope Solitons from Incoherent Waves

Wei Tong, Mingzhong Wu, Lincoln D. Carr, Boris A. Kalinikos

(Submitted on 9 Dec 2009)

This letter reports experimental results on a new type of soliton: the random temporal dark soliton. One excites an incoherent large-amplitude propagating spin-wave packet in a ferromagnetic film strip with a repulsive, instantaneous nonlinearity. One then observes the random formation of dark solitons from this wave packet. The solitons appear randomly in time and in position relative to the entire wave packet. They can be gray or black. For wide and/or very strong spin-wave packets, one also observes multiple dark solitons. In spite of the randomness of the initial wave packets and the random formation processes, the solitons show signatures that are found for conventional coherent dark solitons.

Comments: 10 pages, 4 figures, double-spaced preprint format

Subjects: **Mesoscale and Nanoscale Physics (cond-mat.mes-hall)**; Pattern Formation and Solitons (nlin.PS)

Cite as: [arXiv:0912.1833v1](https://arxiv.org/abs/0912.1833v1) [cond-mat.mes-hall]

## Submission history

From: Lincoln D. Carr [[view email](#)]

[v1] Wed, 9 Dec 2009 18:46:31 GMT (355kb)

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

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

## Download:

- [PDF only](#)

Current browse context:

**cond-mat.mes-hall**

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

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

Change to browse by:

[cond-mat](#)

[nlin](#)

[nlin.PS](#)

## 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](#)