



## Ultrashort light bullets described by the two-dimensional sine-Gordon equation

Submitted by Emmanuel Lemoine on Wed, 10/29/2014 - 11:46

Titre	Ultrashort light bullets described by the two-dimensional sine-Gordon equation
Type de publication	Article de revue
Auteur	Leblond, Hervé [1], Mihalache, Dumitru [2]
Editeur	American Physical Society
Type	Article scientifique dans une revue à comité de lecture
Année	2010
Langue	Anglais
Date	2010/06/16
Numéro	6
Pagination	063815
Volume	81
Titre de la revue	Physical Review A
ISSN	1050-2947

### Résumé en anglais

By using a reductive perturbation technique applied to a two-level model, this study puts forward a generic two-dimensional sine-Gordon evolution equation governing the propagation of femtosecond spatiotemporal optical solitons in Kerr media beyond the slowly varying envelope approximation. Direct numerical simulations show that, in contrast to the long-wave approximation, no collapse occurs, and that robust (2+1)-dimensional ultrashort light bullets may form from adequately chosen few-cycle input spatiotemporal wave forms. In contrast to the case of quadratic nonlinearity, the light bullets oscillate in both space and time and are therefore not steady-state lumps.

URL de la notice <http://okina.univ-angers.fr/publications/ua5188> [3]

DOI [10.1103/PhysRevA.81.063815](http://dx.doi.org/10.1103/PhysRevA.81.063815) [4]

Lien vers le document <http://dx.doi.org/10.1103/PhysRevA.81.063815> [4]

---

### Liens

[1] <http://okina.univ-angers.fr/herve.leblond/publications>

[2] [http://okina.univ-angers.fr/publications?f\[author\]=8696](http://okina.univ-angers.fr/publications?f[author]=8696)

[3] <http://okina.univ-angers.fr/publications/ua5188>

[4] <http://dx.doi.org/10.1103/PhysRevA.81.063815>

Publié sur *Okina* (<http://okina.univ-angers.fr>)