

**Godet, Nicolas**

**Blow-up in several points for the nonlinear Schrödinger equation on a bounded domain.**

(English) [Zbl 1249.35303](#)

Differ. Integral Equ. 24, No. 5-6, 505-517 (2011).

We consider the  $L^2$ -critical focusing nonlinear Schrödinger equation posed on a bounded and regular domain  $\Omega$  of  $\mathbb{R}^d$  (with  $d = 2, 3$ ):  $i\partial_t u + \Delta u = -|u|^{4/d}u$ ,  $(t, x) \in [0, T) \times \Omega$  with initial data and the Dirichlet boundary condition.

In [Commun. Math. Phys. 129, No. 2, 223–240 (1990; [Zbl 0707.35021](#))] *F. Merle* shows that if  $\Omega$  is the whole space  $\mathbb{R}^d$  (without restriction on  $d$ ) then given  $p$  points in  $\mathbb{R}^d$ , there exists a solution of the focusing nonlinear Schrödinger equation with  $L^2$ -critical nonlinearity that blows up at the  $p$  points. The aim of this paper is to show that this result is still true if  $\mathbb{R}^d$  is replaced by a bounded and regular domain of  $\mathbb{R}^d$  with  $d = 2, 3$ .

Reviewer: From the introduction.

**MSC:**

[35Q55](#) NLS equations (nonlinear Schrödinger equations)

[35B44](#) Blow-up in context of PDEs

Cited in 4 Documents

**Keywords:**

nonlinear Schrödinger equation; blow up;  $L^2$ -critical nonlinearity

**Full Text:** [arXiv](#)