Alves, Claudianor O.; Figueiredo, Giovany M.; Furtado, Marcelo F.
On the number of solutions of NLS equations with magnetics fields in expanding domains.
(English) Zbl 1234.35236 J. Differ. Equations 251, No. 9, 2534-2548 (2011).

Summary: We look for multiple weak solutions \( u : \Omega_\lambda \to \mathbb{C} \) for the complex equation
\[
-(i\nabla - A(x))^2 u + f(|u|^2)u = 0 \quad \text{in} \quad \Omega_\lambda = \lambda \Omega.
\]
The set \( \Omega \subset \mathbb{R}^N \) is a smooth bounded domain, \( \lambda > 0 \) is a parameter, \( A \) is a regular magnetic field and \( f \) is a superlinear function with subcritical growth. Our main result relates, for large values of \( \lambda \), the number of solutions with the topology of the set \( \Omega \). In the proof we apply minimax methods and Ljusternik-Schnirelmann theory.

MSC:
35Q55 NLS equations (nonlinear Schrödinger equations)
35A15 Variational methods applied to PDEs
35H30 Quasilinear elliptic equations
35D30 Weak solutions to PDEs

Keywords:
nonlinear Schrödinger equations; electromagnetic fields; complex-valued solutions; variational methods; Ljusternik-Schnirelmann category; electromagnetic fields

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