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Self-focusing multibump standing waves in expanding waveguides. (English) Zbl 1229.35285
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Summary: Let M be a smooth k -dimensional closed submanifold of \mathbb{R}^N , $N \geq 2$, and let Ω_R be the open tubular neighborhood of radius 1 of the expanded manifold $M_R := \{R_x : x \in M\}$. For R sufficiently large we show the existence of positive multibump solutions to the problem

$$-\Delta u + \lambda u = f(u) \quad \text{in } \Omega_R, \quad u = 0 \quad \text{on } \partial\Omega_R.$$

The function f is superlinear and subcritical, and $\lambda > -\lambda_1$, where λ_1 is the first Dirichlet eigenvalue of $-\Delta$ in the unit ball in \mathbb{R}^{N-k} .

MSC:

35Q60 PDEs in connection with optics and electromagnetic theory
78A50 Antennas, waveguides in optics and electromagnetic theory
78A60 Lasers, masers, optical bistability, nonlinear optics

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