

STANDING WAVE CONCENTRATING ON COMPACT MANIFOLD FOR NONLINEAR SCHRÖDINGER EQUATIONS

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Abstract

For $k = 1, \dots, K$, let M_k be a q_k -dimensional smooth compact orientable manifold in \mathbb{R}^N with $q_k \in \{1, \dots, N-1\}$. We consider the equation $-\varepsilon^2 \Delta u + V(x)u - u^p = 0$ in \mathbb{R}^N where for each $k \in \{1, \dots, K\}$ and some $m_k > 0$, $V(x) = |\text{dist}(x, M_k)|^{m_k} + O(|\text{dist}(x, M_k)|^{m_k+1})$ as $\text{dist}(x, M_k) \rightarrow 0$. For a sequence of ε converging to zero, we will find a positive solution u_ε of the equation which concentrates on $M_1 \cup \dots \cup M_K$.