Nodal solutions for singularly perturbed equations with critical exponential growth

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The existence and concentration behavior of nodal solutions are established for the equation
\[-\epsilon^2 \Delta u + V(z)u = f(u) \text{ in } \Omega,\]
where \(\Omega\) is a domain in \(\mathbb{R}^2\), not necessarily bounded, \(V\) is a positive Hölder continuous function and \(f \in C^1\) is an odd function having critical exponential growth. The main tools used is Variational Methods, Inequality of Trudinger & Moser and some arguments developed by Alves & Soares and Bartsch, Weth & Willem.

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