Groundstate asymptotics for a class of singularly perturbed p-Laplacian problems in $\mathbb{R}^N$

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Abstract

I will discuss the asymptotic behavior of positive groundstate solutions to the quasilinear elliptic equation

$$-\Delta_p u + \varepsilon u^{p-1} - u^{q-1} + u^{l-1} = 0 \qquad \text{in} \quad \mathbb{R}^N \tag{P_ε}$$

where $1 < p < N$, $p < q < l < +\infty$ and $\varepsilon > 0$ is a small parameter. For $\varepsilon \to 0$, a characterisation of asymptotic regimes will be given as a function of the parameters q, l and N. In particular, the behavior of the groundstates is sensitive to whether q is less than, equal to, or greater than the critical Sobolev exponent $p^* := \frac{pN}{N-p}$. This is a joint work with W. Albalawi and V. Moroz.

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