Antimaximum principle in exterior domains

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Abstract

We consider the antimaximum principle for the p-Laplacian in the exterior domain:

$$\begin{cases} -\Delta_p u = \lambda K(x)|u|^{p-2}u + h(x) \quad \text{in } B_1^c, \\ \qquad u = 0 \quad \text{on } \partial B_1, \end{cases}$$

where Δ_p is the p-Laplace operator with $p > 1$, λ is the spectral parameter and B_1^c is the exterior of the closed unit ball in $\mathbb{R}^N$ with $N \geq 1$. The function h is assumed to be nonnegative and nonzero, however the weight function K is allowed to change its sign. For K in a certain weighted Lebesgue space, we prove that the antimaximum principle holds locally. A global antimaximum principle is obtained for h with compact support.

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