A class of multiparameter p-Laplacian elliptic systems in the exterior of a ball

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April 28, 2020

Abstract

We prove the existence, multiplicity and nonexistence of positive radial solutions to the following p-Laplacian equations $$ \left \{ \begin{array}{l} -\triangle_p z_1=g_1(|x|,z_1,z_2,a,b) \ \ \text{in} \ \Omega,\\ -\triangle_p z_2=g_2(|x|,z_1,z_-2,a,b) \ \ \text{in} \ \Omega,\\ (z_1, z_2) \rightarrow (0,0)\ \ as\ \ |x|\rightarrow \infty,\\ \frac{\partial z_1}{\partial n} =\frac{\partial z_2}{\partial n}= 0\ \ \text{on}\ \ |x|=r_0, \end{array} \right. $$ where $\triangle_p u=\text{div}({|\nabla u|}ˆ{p-2}\nabla u),\ 1r_0>0\}$.

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