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On the equation \( \text{div} \left( |\nabla u|^{p-2} \nabla u \right) + \lambda |u|^{p-2} u = 0. \)


The author shows that the first eigenvalue for the equation in the title is simple (i.e., all associated eigenfunctions are multiples of each other) in any bounded domain \( \Omega \), without assuming any regularity of \( \partial \Omega \). Previous results of this type needed at least \( C^2 \)-regularity of \( \partial \Omega \) [see, e.g., A. Anane, C. R. Acad. Sci. Paris Sér. I Math. 305 (1987), no. 16, 725–728; MR0920052 (89e:35124)].

It is also proved that among all eigenfunctions only the first eigenfunction is positive and that the first eigenvalue is isolated, for a general bounded domain \( \Omega \).

Reviewed by Juan J. Manfredi

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