

Nonexistence of radial positive solutions for a class of semilinear elliptic systems in an annulus

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Abstract: Consider the system

$$\begin{cases} -\Delta u(x) = \lambda f(v(x)) & \text{in } \Omega \\ -\Delta v(x) = \mu g(u(x)) & \text{in } \Omega \\ u(x) = v(x) = 0 & \text{on } \partial\Omega, \end{cases} \quad (1)$$

where Ω is an annulus in \mathbb{R}^N ($N \geq 2$) and λ, μ are positive constants bounded away from 0 with $\lambda\mu$ large. We prove the nonexistence of radial positive solutions, when the nonlinearities f and g may have more than one zero and increasing from the last zero.

References

- [1] A. Castro, C. Maya and R. Shivaji, Positivity of nonnegative solutions for cooperative semipositone systems, Proc. Dynamic Systems and Applications, Vol 3(2001), pp. 113-120.
- [2] D. D. Hai and S. Oruganti and R. Shivaji; Nonexistence of Positive Solutions for a Class of Semilinear Elliptic Systems, Rocky Mountain Journal of Mathematics. Volume 36, Number6(2006), 1845-1855.
- [3] D. D. Hai and R. Shivaji, Positive solutions for semipositone systems in the annulus, Rocky Mountain J. Math., 29(4)(1999), pp. 1285-1299.
- [4] Said Hakimi, Nonexistence of radial positive solutions for a nonpositone system in an annulus; Eletronic Journal of Differential Equations, Vol. 2011(2011), No. 152, pp. 1-7.
- [5] W. C. Troy, Symmetry properties in systems of semilinear elliptic equations, J. Differential Equations, 42(1981),pp. 400-413.