

第269回 広島数理解析セミナー (2023年度)

Hiroshima Mathematical Analysis Seminar No.269

日時 : 7月24日(月) 16:30~17:30

場所 : 広島大学理学部 B707

(今年度のセミナーの定例開催曜日は金曜日ですが、今回は月曜日ですのでご注意ください)

講師 : Julián López-Gómez 氏 (Complutense University of Madrid)

題目 : Nodal solutions for a class of degenerate BVP's

要旨 : In this talk we characterize the existence of nodal solutions for a generalized class of one-dimensional diffusive logistic type equations, including

$$-u'' = \lambda u - a(x)u^3, \quad x \in [0, L],$$

under the boundary conditions $u(0) = u(L) = 0$, where λ is regarded as a bifurcation parameter, and the non-negative weight function $a(x)$ vanishes on some subinterval

$$[\alpha, \beta] \subset (0, L)$$

with $\alpha < \beta$.

At a later stage, the general case when $a(x)$ vanishes on finitely many subintervals with the same length is analyzed. Finally, we construct some examples with classical non-degenerate weights, with $a(x) > 0$ for all $x \in [0, L]$, where the BVP has an arbitrarily large number of solutions with one node in $(0, L)$. These are the first examples of this nature constructed in the literature.

References:

P. Cubillos, J. López-Gómez and A. Tellini, *Multiplicity of nodal solutions in classical non-degenerate logistic equations*, El. Res. Archive **30** (2022), 898–928.

J. López-Gómez, M. Molina-Meyer and P. H. Rabinowitz, *Global bifurcation diagrams of one-node solutions on a class of degenerate boundary value problems*, Disc. Cont. Dyn. Syst. B **22** (2017), 923–946.

J. López-Gómez and P. H. Rabinowitz, *Nodal solutions for a class of degenerate one dimensional BVP's*, Top. Meth. Nonl. Anal. **49** (2017), 359–376.

J. López-Gómez and P. H. Rabinowitz, *The structure of the set of 1-node solutions for a class of degenerate BVP's*, J. Differential Equations **268** (2020), 4691–4732.

P. H. Rabinowitz, *A note on a nonlinear eigenvalue problem for a class of differential equations*, J. Differential Equations **9** (1971), 536–548.

本セミナーに参加ご希望の方は、広島数理解析セミナーのホームページ

<http://www.math.sci.hiroshima-u.ac.jp/ca/seminar.html>

にあるフォームからお申し込み下さい。

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