

A Leighton-Wintner Type Oscillation Theorem for $p(t)$ -Laplacian Dynamic Equations on Time Scales

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Abstract

This study is based on joint work (including [3, 4]) with Professors K. Fujimoto (Shimane University) and K. Ishibashi (Hiroshima Institute of Technology). It is known that applying the Riccati method to discrete oscillation problems is challenging (see [2]). Recently, however, the authors established oscillation criteria for difference equations involving the $p(t)$ -Laplacian by utilizing the Riccati technique (see [4]). Based on the ideas developed there, we establish a Leighton-Wintner type oscillation theorem via the Riccati method for dynamic equations on time scales, which are applicable to both continuous and discrete cases. This work was supported by JSPS KAKENHI Grant Number JP25K07092.

References

- [1] M. Bohner and A. Peterson, *Dynamic equations on time scales*, Birkhäuser Boston, Inc., Boston, MA, 2001.
- [2] O. Došlý and P. Řehák, *Half-linear differential equations*, North-Holland Math. Stud., 202, Elsevier Science B.V., Amsterdam, 2005.
- [3] K. Fujimoto and M. Onitsuka, *Leighton-Wintner type oscillation criteria for second-order differential equations with $p(t)$ -Laplacian*, Electron. J. Qual. Theory Differ. Equ., 2024 (2024), Paper No. 19, 9pp.
- [4] K. Fujimoto, K. Ishibashi, and M. Onitsuka, *Leighton-Wintner-type oscillation theorem for the discrete $p(k)$ -Laplacian*, Appl. Math. Lett., 163 (2025), Paper No. 109465, 6 pp.