

**Journal of Analysis and Applications**

Vol. 24 (2026), No.1, pp.27-34

ISSN: 0972-5954

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URL : [www.sasip.net](http://www.sasip.net)

# Higher-order difference equations with Fibonacci-Genocchi polynomials

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**Abstract.** This paper presents the construction of higher-order difference equations whose solutions are expressed in terms of Fibonacci-Genocchi polynomials. By extending the recursive properties of Fibonacci numbers and incorporating the structural features of Genocchi sequences, these polynomials provide a natural framework for analyzing discrete systems. The resulting equations highlight the interplay between combinatorial recursion and difference calculus, offering a concise generalization of classical polynomial families.

**AMS Subject Classification (2020):** 11B39, 11B83, 05A19, 33C45, 39A06

**Keywords:** Fibonacci-Genocchi polynomials, higher-order difference equations, Fibonacci calculus

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