A unified approach to multivariate polynomial sequences with real stability

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Abstract

We give some new sufficient conditions for a sequence of multivariate polynomials to be real stable. As applications, we obtain the real stability of many important multivariate polynomials, such as multivariate Eulerian polynomials, multivariate Bell polynomials and multivariate polynomials over Stirling permutations in a unified manner. And we also show some new results, such as the real stability of multivariate polynomials over Jacobi-Stirling permutations, and the proper position property of multivariate matching polynomials.

Keywords: Real stability; Multivariate polynomial sequences; Recurrence relations; Proper position property.

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