

## Holonomic Polynomial Sequences I: Degree Growth

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A sequence  $P_n(x)$  of polynomials in  $x$  is holonomic (P-recursive) if it satisfies a linear recurrence with polynomial coefficients in  $x$  and  $n$ . Many polynomial sequences from combinatorics, representation theory and number theory are shown to be holonomic. It is natural and fundamental to study the degree pattern of holonomic polynomial sequences. We will present a classification of the degree growth of such sequences and explain two applications related to combinatorial identities and exponential sums over finite fields respectively.

### Keywords

Holonomic sequences, Degree structure, Vanishing sums, Exponential sums