
Non-Holonomic Sequences and Functions

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TUE/P2 15:30–15:50

Holonomic sequences and functions, characterised by linear difference/differential equations with polynomial coefficients, play an important role in discrete mathematics. Proving a function, and thus the sequence of its Taylor coefficients, to be *non*-holonomic can be regarded as sort of a strong transcendence result. We give an overview of recent work in this vein, with a focus on complex asymptotic methods. The tools invoked include Carlson's Theorem, Khovanskii's theory of Fewnomials, and Lindelöf integral representations.

- [1] STANLEY, R. P.: Differentiably finite power series. *European Journal of Combinatorics* **1** (1980), 175–188.
- [2] FLAJOLET, P., GERHOLD, S., AND SALVY, B.: On the non-holonomic character of logarithms, powers, and the n th prime function. *Electronic Journal of Combinatorics* **11**, 2 (2005), 1–16.
- [3] BELL, J. P., GERHOLD, S., KLAZAR, M., AND LUCA, F.: Non-holonomicity of sequences defined via elementary functions. *Annals of Combinatorics* **12**, 1 (2008), 1–16.
- [4] FLAJOLET, P., GERHOLD, S., AND SALVY, B.: Lindelöf Representations and (Non)Holonomic Sequences. Preprint, 2009.