

Reduction Based Creative Telescoping for Definite Summation of P-recursive Sequences: the Integral Basis Approach

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Integral bases have been used for designing reduction-based telescoping algorithm for algebraic functions [1] and D-finite functions [2]. The notion of integral bases for D-finite functions has recently been generalized to P-recursive sequences [3]. As a discrete analogue, we develop a reduction-based creative telescoping algorithm for P-recursive sequences via integral bases.

Keywords

Creative telescoping, Holonomic sequences, Symbolic summation

References

[1] SHAOSHI CHEN; MANUEL KAUERS; CHRISTOPH KOUTSCHAN, *Reduction-Based Creative Telescoping for Algebraic Functions*. In Proceedings of the 2016 International Symposium on Symbolic and Algebraic Computation (ISSAC’ 16), pages 175–182, New York, NY, 2016.

[2] SHAOSHI CHEN; LIXIN DU; MANUEL KAUERS, *Hermite Reduction for D-finite Functions via Integral Bases*. In Proceedings of the 2023 International Symposium on Symbolic and Algebraic Computation (ISSAC’ 23), New York, NY, 2023.

[3] SHAOSHI CHENA; LIXIN DU; MANUEL KAUERS; THIBAUT VERRON, *Integral Bases for P-Recursive Sequences*. In Proceedings of the 2020 International Symposium on Symbolic and Algebraic Computation (ISSAC’ 20), pages 91–98. New York, NY, 2020.