

New Dimension Polynomials and Invariants of Inversive Difference-Differential Field Extensions

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We introduce a new type of reduction in the ring of inversive difference-differential polynomials and use the corresponding technique of autoreduced sets to prove the existence and outline a method of computation of dimension polynomials of a new type associated with finitely generated inversive difference-differential field extensions. We show that the obtained dimension polynomials (which are numerical polynomials in three variables) carry more difference-differential birational invariants than previously known univariate and bivariate difference-differential dimension polynomials (see, for example, [1, Section 6.7 and Chapter 7], [2] and [3]). We describe these invariants and show how they can be applied to the equivalence problem for systems of algebraic difference-differential equations.

Keywords

Difference-differential field, autoreduced set, dimension polynomial

References

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