ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

2. Algebra

1991 MS Classification: 12, 13
Levin, Alexander, The Catholic Univ. of America, Washington, D. C., USA
Multivariable dimension polynomials and their invariants.
Let $R = F[X]$ be a ring of generalized polynomials over a field F and let a partition of the set of indeterminates X into n disjoint subsets be fixed. Considering R as a filtered ring with a natural n-dimensional filtration, we introduce a special type of reduction in this ring and develop the appropriate technique of characteristic sets that allows us to prove that the n-variable Hilbert function of a finitely generated filtered R-module is polynomial. When R is a ring of differential operators, we obtain a generalization of the classical Kolchin theorem on differential dimension polynomial and find new invariants of a finitely generated differential field extension.