

Factoring differential operators in positive characteristic

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We present an algorithm to factor differential operators with coefficients in an algebraic function field K of characteristic p , provided with the usual derivation, as a product of irreducible differential operators with coefficients in K . We make use of tools specific to the characteristic p , such as the p -curvature or the arising central simple algebra structure. In particular we shall see that factoring differential operators ultimately reduces to solving some " p -Ricatti" equations, for which purpose we use tools of algebraic geometry.

Keywords

Differential operators, Factorisation, Positive characteristic, p -curvature, Central simple algebras