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*On computation of minimal free resolutions over solvable polynomial algebras*

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**Abstract:** Let $A = K[a_1, \ldots, a_n]$ be a (noncommutative) solvable polynomial algebra over a field $K$ in the sense of A. Kandri-Rody and V. Weispfenning [*Non-commutative Gröbner bases in algebras of solvable type*, J. Symbolic Comput. **9** (1990), 1–26]. This paper presents a comprehensive study on the computation of minimal free resolutions of modules over $A$ in the following two cases: (1) $A = \bigoplus_{p\in\mathbb{N}} A_p$ is an $\mathbb{N}$-graded algebra with the degree-0 homogeneous part $A_0 = K$; (2) $A$ is an $\mathbb{N}$-filtered algebra with the filtration $\{F_pA\}_{p\in\mathbb{N}}$ determined by a positive-degree function on $A$.

**Keywords:** solvable polynomial algebra; Gröbner basis; minimal free resolution
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