

Seminar

Computational Algebra

Lehrstuhl D für Mathematik

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Vortragsankündigung

Zeit und Ort: **Di., 24.11.2009, 10:00 – 11:30 in 203, Bibliothek Lehrstuhl D**

Vortragender: **Andriy Regeta, Technische Universität Kaiserslautern**

Titel: **Graded Weyl algebra and Dixmier Conjecture**

Inhalt: Weyl algebras are classically viewed as \mathbb{N} -filtered algebras with associated graded algebras being commutative. However, they can be viewed as \mathbb{Z} -graded algebras as well. In this talk we report on the advantages of working with \mathbb{Z} -grading in polynomial arithmetics and on some results, which have been obtained using the graded approach. In particular, one gets convenient closed form for many formulae in Weyl algebra with connections to combinatorics.

This can help in many difficult problems in Weyl algebras and gives a way to reduce some algebraic questions to finding polynomial solutions of certain nonlinear difference equations. Surprisingly, quite often it is easy to decide, that such equations have no polynomial solutions.

Using such graded techniques we give short proofs for some results in Weyl algebra. We study the first Dixmier Conjecture (which states that any nonzero endomorphism of a Weyl algebra is an automorphism). We prove some weaker versions of it, in particular showing that any graded endomorphism is an automorphism in the first Weyl algebra. For the n -th Weyl algebra, we prove that the same holds true in the generic case. That is, if the grading weights $w_i \in \mathbb{R}$ for an n -th Weyl algebra are \mathbb{Z} -linearly independent.

Wir laden alle Interessierten herzlich zu diesem Vortrag ein.