

2006

University of Central Florida
Department of Mathematics
Distinguished Lecturer Series

Professor Juergen Herzog

of

University of Essen, Germany

Symbolic Powers of Monomial Ideals and Vertex Cover Algebras

This is the report on joint work with Takayuki Hibi and Ngô Việt Trung. In this lecture we study symbolic Rees algebras of monomial ideals.

Our motivation to study symbolic powers comes from combinatorics. Suppose G is a finite graph on the vertex set $[n] = \{1, \dots, n\}$ without loops and multiple edges. We say that an integer vector $a = (a(1), \dots, a(n))$ with $a(i) \geq 0$ for $i = 1, \dots, n$ is a vertex cover of G of order k if $a(i) + a(j) \geq k$ for all edges $\{i, j\}$ of G . We fix a field K and let $S = K[x_1, \dots, x_n]$ be the polynomial ring in n variables over K . Then we define the K -subalgebra of the polynomial ring $S[t]$ generated by all monomials $x_1^{a(1)} \dots x_n^{a(n)} t^k$ where $a = (a(1), \dots, a(n))$ is a vertex cover of G of order k , and call this the vertex cover algebra of G . It turns out that vertex cover algebras are symbolic Rees algebras for a special classes of monomial ideals.

We will show that the symbolic Rees algebras of any monomial ideal is finitely generated, and discuss bounds for the degrees of the generators.

DATE: Wednesday, March 29, 2006

TIME: 10:30 AM – 11:30 AM

PLACE: Math and Physics Building, Room 233

Coffee will be served.