

Some results on the Lex-Plus-Power conjecture

Giulio Caviglia
Purdue University

A conjecture by Eisenbud, Green and Harris states that for every homogeneous ideal I in $S = K[x_1, \dots, x_n]$ containing a homogeneous regular sequence $f_1, \dots, f_r$ of degrees $d_1 \leq d_2 \leq \dots \leq d_r$ there exists a lex segment ideal L such that I and $L + (X_1^{d_1}, \dots, X_r^{d_r})$ have the same Hilbert function.

The Lex-Plus-Power conjecture of Evans claims that furthermore the graded Betti numbers over S of I are bounded above by the ones of $L + (X_1^{d_1}, \dots, X_r^{d_r})$.

We show that the Lex-Plus-Power conjecture hold when the characteristic of the field K is zero and $d_i > \sum_{j=1}^{i-1} (d_j - 1)$ for all $i > 1$.