

Effective Normality Criteria for Algebras of Linear Type

W. Vasconcellos (Rutgers)

The algebras studied here are subalgebras of rings of polynomials generated by 1-forms (so-called Rees algebras), with coefficients in a Noetherian ring. Given a normal domain R and a torsionfree module E with a free resolution, we study the role of the matrices of syzygies in the normality of the Rees algebra of E . When the Rees algebra of E and the symmetric algebra $S(E)$ coincide, the main result characterizes normality in terms of an ideal of $S(E)$ determined by the second module of syzygies of E and of the completeness of the first s symmetric powers of E (s is the rank of the first module of syzygies). It requires that R be a regular domain. Special results, under broader conditions on R , are still more effective. (This is joint work with J. Brennan.)