1015-13-49 **Thuy Pham** (thuy@math.rutgers.edu), Department of Mathematics, Rutgers University, Piscataway, NJ 08854, and **Wolmer V Vasconcelos*** (vasconce@math.rutgers.edu), Department of Mathematics, Rutgers University, Piscataway, NJ 08854. *Complexity of the Normalization of Algebras.*

We introduce and develop new techniques to study the complexity of normalization processes of graded algebras. The construction of a new degree function on graded modules, with a global nature, permits a broad extension of recent bounds for the length of the chains of subalgebras that general algorithms must transverse to build the integral closure, particularly of blowup algebras. It achieves this by relating the values of the new degree with invariants of the algebra known ab initio. As a by-product, it reveals new inequalities among Hilbert coefficients. (Received January 15, 2006)