

Some remarks on generalized Cohen-MacAulay rings

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Abstract

We consider the possibility of characterizing Buchsbaum and some special generalized Cohen-Macaulay rings by systems of parameters having certain properties of regular sequences. As an application, we give a bound on Castelnuovo-Mumford regularity of so-called (k, d) -Buchsbaum graded K -algebras.

1 Introduction

Let A be a noetherian local ring (resp. K -algebra) of $\dim A = d$ and \underline{m} the maximal (resp. homogeneous maximal) ideal of A . A is called a generalized Cohen-Macaulay (abbr. C-M) ring if all local cohomology modules $H_{\underline{m}}^i(A)$, $i < d$, are of finite length [19]. The class of generalized C-M rings are rather large. The most important subclass among them form Buchsbaum rings [20]. In order to have a unified approach in studying Buchsbaum, quasi-Buchsbaum, and other generalized C-M rings, the notion of (k, r) -Buchsbaum rings was recently introduced, where $k \geq 0$ and $1 \leq r \leq d$ are some integers (see [6, 10, 14, 15]). With this new notion we have a refined classification of generalized C-M rings. Buchsbaum rings are exactly $(1, d)$ -Buchsbaum rings.

Our remarks are related to the possibility of characterizing Buchsbaum rings by systems of parameters (abbr. s.o.p.'s) having certain generalized properties of

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