

Abstract

In Chapter 1, some basic definitions and results from commutative algebra are given.

In Chapter 2, we study the behavior of Stanley decompositions under the operation of localization with respect to a variable. We prove how prime filtrations behave under localization. We observe that pretty clean filtrations under localization are still pretty clean filtrations.

In Chapter 3, we introduce the concept of Stanley decompositions in the localized polynomial ring S_f where f is a product of variable, and show that S_f has a canonical Stanley decomposition and that the Stanley depth does not decrease upon localization. Furthermore it is shown that for monomial ideals $J \subset I \subset S_f$, the number of maximal Stanley spaces in a Stanley decomposition of I/J is an invariant of I/J . We also introduce the Hilbert series of \mathbb{Z}^n -graded K -vector space.