

HOLES IN AFFINE MONOIDS

A hole in an affine monoid Q is an element in its normalization \bar{Q} , that it not contained in Q . The set $\bar{Q} \setminus Q$ of holes can be decomposed in a unique geometric way. This decomposition yields a nice description of several properties of Q . Moreover, it is closely related to the graded components of the local cohomology of the corresponding semigroup ring. This allows a cohomological characterization of seminormal semigroup rings. Moreover, if the ring is seminormal, then its Castelnuovo-Mumford regularity can be bounded.