

# Perturbations of ideals in local rings

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Let  $I$  be an ideal of a Noetherian local ring  $R$ . We study how properties of the ideal change under small perturbations, that is, when  $I$  is replaced by an ideal  $J$  which is the same as  $I$  modulo a large power of the maximal ideal. In particular, assuming that  $R/J$  has the same Hilbert function as  $R/I$ , we show that the Betti numbers of  $R/J$  coincide with those of  $R/I$ . We also compare the local cohomology modules of  $R/J$  with those of  $R/I$ .