1024-13-77 **Gennady Lyubeznik*** (gennady@math.umn.edu), Department of Mathematics, 206 Church Street S.E., University of Minnesota, Minneapolis, MN 55455. *A necessary condition for the vanishing of some local cohomology in complete regular local rings.* Preliminary report.

Let R be a complete regular local ring containing a field. Let n be the dimension of R and assume the residue field of R is separably closed. Let I be an ideal of R and let $P_1, \ldots, P_s$ be the minimal primes of I. Let Δ be the simplicial complex on vertices $\{1, \ldots, s\}$ such that a simplex $\{i_0 \ldots, i_j\}$ is included in Δ if and only if $P_{i_0} + \ldots + P_{i_j}$ is primary to the maximal ideal of R.

It has been known that $H^i_I(R) = 0$ for $i \geq n-1$ if and only if $\dim R/P_i \geq 2$ for every i and Δ is connected. We show that $H^i_I(R) = 0$ for $i \geq n-2$ only if $\tilde{H}_*(\Delta; \mathbb{Z}/p\mathbb{Z}) = 0$ for $* = 0, 1$ where $\tilde{H}_*(\Delta; \mathbb{Z}/p\mathbb{Z})$ denotes the reduced singular homology of Δ with coefficients in $\mathbb{Z}/p\mathbb{Z}$ and p is the residual characteristic of R. (Received December 29, 2006)