1035-13-1068 **Ian Aberbach** and **Jinjia Li*** (jli32@syr.edu), Department of Mathematics, 215 Carnegie, Syracuse University, Syracuse, NY 13244. *Vanishing conditions which force regularity in local rings of prime characteristic.*

Let (R, k) be a local ring of positive prime characteristic. We show that under mild conditions, if a free resolution of k has stably phantom homology at the ith spot for some $i > 0$, then R is a regular local ring. Consequently, if R is an excellent local domain and $\operatorname{Tor}_i^R(k, R^+) = 0$ for some $i > 0$, then R is regular (where R^+ is the absolute integral closure of R). Both of the two results were previously known only for $i = 1$ or 2 via completely different methods. An improved version of a recent result of Bridgeland and Iyenyar (in the positive characteristic case) also follows from this. (Received September 18, 2007)