

# ON THE FINITENESS AND STABILITY OF CERTAIN SETS OF ASSOCIATED PRIME IDEALS OF LOCAL COHOMOLOGY MODULES (SCI)

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## TÓM TẮT:

Let  $R$  be a Noetherian local ring,  $I$  an ideal of  $R$ , and  $N$  a finitely generated  $R$ -module. Let  $k \geq -1$  be an integer and  $r = \text{depth}_k(I, N)$  the length of a maximal  $N$ -sequence in dimension  $> k$  in  $I$  defined by Brodmann and Nhan in (2008). For a subset  $S \subseteq \text{Spec } R$ , we set  $S_{\geq k} = \{p \in S \mid \dim(R/p) \geq k\}$ . We first prove in this article that  $\text{Ass}_R(H^j_I(N)_{\geq k})$  is a finite set for all  $j \leq r$ . Let  $N = \bigoplus_{n \geq 0} N_n$  be a finitely generated graded  $R$ -module, where  $R$  is a finitely generated standard graded algebra over  $R_0 = R$ . Let  $r$  be the eventual value of  $\text{depth}_k(I, N_n)$ . Then our second result says that for all  $j \leq r$  the sets  $\bigcup_{i \leq j} \text{Ass}_R(H^i_I(N_n)_{\geq k})$  are stable for large  $n$ .