



Lower bounds for finiteness of generalized local cohomology modules and their associated primes

Moharram Aghapournahr, Alireza Vahidi

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Let R be a commutative Noetherian ring with non-zero identity, \mathfrak{a} an ideal of R , M a finite R -module and X an arbitrary R -module. In this paper, we study relations between finiteness of local cohomology and generalized local cohomology modules in several cases. We characterize the membership of generalized local cohomology modules in a certain Serre class from lower bounds and we found the least integer such that these modules belong to that Serre class.

Let n be a non-negative integer, we prove that $\bigcup_{i < n} \text{Supp}_R(\mathcal{L}_i^{\mathfrak{a}}(M, X)) = \bigcup_{i < n} \text{Supp}_R(\mathcal{L}_i^{\mathfrak{a} + \text{Ann}_R(M)}(X)) = \bigcup_{i < n} \text{Supp}_R(\text{Ext}_R^i(M/\mathfrak{a}M, X))$ and if $\mathcal{L}_i^{\mathfrak{a}}(M, X) = 0$ for all $i < n$ then $\text{Ass}_R(\mathcal{L}_n^{\mathfrak{a}}(M, X)) = \text{Ass}_R(\text{Ext}_R^n(M/\mathfrak{a}M, X))$, these imply that if $\text{Supp}_R(\mathcal{L}_i^{\mathfrak{a}}(M, X))$ is finite for all $i < n$, then the finiteness of $\text{Ass}_R(\mathcal{L}_n^{\mathfrak{a}}(M, X))$ is equivalent to the finiteness of $\text{Ass}_R(\text{Ext}_R^n(M/\mathfrak{a}M, X))$.

Comments: 10 pages, some changes has been done

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