A SURVEY OF RESULTS AND PROBLEMS ABOUT $\mathfrak{a}$–COFINITE MODULES

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M is $\mathfrak{a}$–cofinite if it has support in $V(\mathfrak{a})$ and $Ext^i(A/\mathfrak{a}, M)$ is a finite A–module for all i. E.g if N is finite the local cohomology modules $H^i_{\mathfrak{a}}(N)$ are $\mathfrak{a}$–cofinite for all i, in case $\dim A/\mathfrak{a} \leq 1$ and $(A, \mathfrak{m})$ is local. The main problem is to decide whether in this case the category of $\mathfrak{a}$–cofinite modules is abelian or if the kernel and the cokernel of a linear map $f : L \to M$ between cofinite module are also cofinite. This is known when $\mathfrak{a}$ is a prime ideal and A is complete. I show that it suffices to show that if A is complete N is finite $\mathfrak{p}$ is a prime minimal over $\mathfrak{a}$, then $\Gamma_{\mathfrak{p}}(N)$ or $H^1_{\mathfrak{p}}(N)$ is $\mathfrak{p}$–cofinite. These two modules are $\mathfrak{p}$–cofinite at the same time.