Faltings’ finiteness dimension of local cohomology modules over local Cohen-Macaulay rings
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Abstract. Let \((R, \mathfrak{m})\) denote a local Cohen-Macaulay ring and \(I\) a non-nilpotent ideal of \(R\). The purpose of this article is to investigate Faltings’ finiteness dimension \(f_I(R)\) and equidimensionality of certain homomorphic image of \(R\). As a consequence we deduce that \(f_I(R) = \max\{1, \text{ht } I\}\) and if \(\text{mAss}_R(R/I)\) is contained in \(\text{Ass}_R(R)\), then the ring \(R/I + \bigcup_{n \geq 1}(0 :_RI^n)\) is equidimensional of dimension \(\dim R - 1\). Moreover, we will obtain a lower bound for injective dimension of the local cohomology module \(H^\text{ht}I_R(R)\), in the case \((R, \mathfrak{m})\) is a complete equidimensional local ring.